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ABSTRACT

The recruitment process of the Bachelor of Science in Engineering Technology (BSET) program at New Jersey Institute of Technology (NJIT) was evaluated. Surveys were conducted to obtain data. Subjects were 163 NJIT students and 293 employment recruiters who conducted campus interviews. Findings indicate that campus recruiters, a majority of whom were engineers, held a condescending attitude toward the technologist and that they and their middle management lacked an understanding of the technologist's functions. The BSET student left the interview with no job and a low opinion of the program. This negative attitude was also found in instructors. Information being exchanged by executives is not being adequately appreciated by those in direct contact with the students. While the technologist student did not do as well at campus interviews as the engineering student did, he did do well when he approached the corporation. Program usefulness is evidenced by the fact that 60% of technologists surveyed had been technically employed for approximately four years. Steps should be taken to keep the BSET program viable in a changing society and to increase general understanding of the program. While this study is school-specific, it speaks to a general problem in placement and employment.
(Author/JLL)

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THE EDUCATIONAL OBJECTIVES OF THE ENGINEERING TECHNOLOGY
PROGRAM AS COMPARED TO THE ENGINEERING PROGRAM AND ITS
EFFECTS ON THE ENGINEERING TECHNOLOGIST POSITION AT
THE ENGINEERING-ORIENTED COLLEGE PLACEMENT
INTERVIEWS AT NEW JERSEY INSTITUTE
OF TECHNOLOGY

A study presented to the
administration and faculty of
New Jersey Institute of Technology

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by

Joseph Mennella

July 1977

TO ALL MY BROTHERS WHO SERVED DURING THE VIETNAM CONFLICT

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Chapter 1

INTRODUCING THE STUDY

The Problem

Each year on a nationwide basis the employers' recruitment among college graduates becomes more competitive for the students seeking immediate employment. While almost all graduates of academic disciplines have an unusually difficult time seeking a professional job, just the opposite is true for engineering graduates. Due to misconceptions about their qualifications, graduates in the engineering technology field have significant difficulty in benefiting from the growing demand for technological services in an improved economy.

The Purpose

The purpose of this study is to evaluate the recruitment process of the Bachelor of Science in Engineering Technology program at New Jersey Institute of Technology. An explanation of the reasons engineering-oriented companies will not consider graduating technologists from four year colleges for employment is the underlying reason for this study. What are the companies looking for when interviewing these prospective employees? Interviewing college recruiters seem to be aware of the differences between a two-year

college graduate in engineering technology and a four-year graduate, such as New Jersey Institute of Technology's Bachelor of Science in Engineering Technology program; however, their job offerings are not always of a professional nature to the four-year candidate. While some employers place these individuals on a professional level, most consider their talents a step below the straight engineering curriculum. This study will attempt to explain the reasoning behind these decisions.

In addition, among some students in both engineering and engineering technology, a failure to recognize the role of the recruiter/interviewer could be part of the dilemma. Most engineering recruiters are employed on a fulltime basis in the personnel/administration field. In other words, they may have had varied employment experiences which are an asset. However, recruiters may not necessarily be technically-oriented themselves. Students tend to have mixed reactions about this; for some it does not make any difference. The other type of recruiter is the engineer or technologist; he may recruit students for his respective field for only a few days out of each year.

Some students remark that this coincidence has no significant bearing in the interview at a college's placement office. This study also addresses itself to these recruitment questions.

This writer undertook to research and implement a tool that would significantly add to the comprehension of a

four-year engineering technology degree among engineering companies. This study would also benefit the New Jersey Institute of Technology's Placement Office, as well as providing pertinent data for the Bachelor of Science in Engineering Technology program itself.

It is then hypothesized that the lack of knowledge of the four-year engineering technology curriculum and its professional quality is the major factor in the prejudiced techniques of the company recruiters in the recruitment interview.

Significance of the Study

There is a need in the educational sector to realize that although the engineering technology diploma is seventeen years of age, it is not yet fully appreciated by engineering companies' recruiters. The writer's observation of the frustrations of the Bachelor of Science in Engineering Technology senior class competing at employment interviews in the New Jersey Institute of Technology Placement Office confirmed this need. If the collated data is significant, it will help the New Jersey Institute of Technology's Placement Office develop a more viable recruitment program for the Bachelor of Science in Engineering Technology graduates. At the least, this data will be incorporated into the college's Engineering Technology Department's curriculum studies.

It is also the desire of the writer to share the findings of this study with the College Placement Council and the Engineers Council for Professional Development.

Definitions of Terms

Placement office. Located in Cullimore Hall on the New Jersey Institute of Technology's campus; this office is responsible for scheduling college recruiters to interview students. In addition to helping students and alumni plan their careers, and write their resumes, it serves as a liaison between industry, societies and fraternities.

College employment interview. Structured around dialogue between a recruiter and the student, this session gives the recruiter the opportunity to present job requirements, the background of the industry or service, and the benefits to the position, while it allows the student to discuss his career objectives as well as his past academic and employment experiences.¹

Recruiter. Employed by the recruiting company, his responsibilities include interviewing prospective employees, counseling students on their strengths and weaknesses, providing information on occupational areas where the student might have the best opportunity for achieving success and happiness, and educating faculty and undergraduates so that future seniors will be better prepared for the world of work, to find their niches in it, and to adjust to it.²

¹E. W. Steele, "Recruiter, Administration-Faculty, Placement-Interviewing," Journal of College Placement, Fall 1975, pp. 45-46.

²Richard A. Stewart and Peter Veruki, "Questions and Issues, How a Placement Director and Recruiter View Priorities," Journal of College Placement, Summer 1974, pp. 34-40.

New Jersey Institute of Technology or NJIT. Founded in 1881 as the Newark Technical School and located in Metropolitan Newark, New Jersey, the Institute is accredited by the Middle States Association and the Engineers Council for Professional Development.

Bachelor of Science in Engineering Technology (BSET). Established at New Jersey Institute of Technology in September 1972, this degree is awarded to students completing a four-year Engineering Technology program. The Engineers Council for Professional Development defines:

engineering technology as that part of the technological field which requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities; it lies in the occupational spectrum between the craftsman and the engineer at the end of the spectrum closest to the engineer.³

NJIT's options in Engineering Technology include construction and contracting, electrical systems, environmental technology, manufacturing technology and mechanical systems.

Limitations

There are several limitations to this study. One is the time factor. Given the time allotted for this study, only the responses of students presently enrolled at NJIT could be considered, for an ongoing alumni address file proved inadequate. Another limiting factor was the lack of available information from recruiters. Due to the nature of

³Engineers Council for Professional Development, Thirty-Fifth Annual Report (New York: ECPD Publications, 1967).

their position, their records often end with the filling of the professional position.

The results of this study will not provide any additional Placement Office services for the 1977 recruitment program. Neither will the study initiate immediate adjustments to the present curriculum in the Bachelor of Science in Engineering Technology Program at New Jersey Institute of Technology. However, it is hoped that the Institute and engineering firms, via the College Placement Council's publications, would recognize the twenty year old dilemma for future modifications and long-range planning.

The nature of the study, which entails both students and company recruiters answering questionnaires is limited in scope. First, although engineering technology is not a segment of every engineering college's curriculum, it is a part of a wide cross-section of American educational institutions. The students in the Bachelor of Science in Engineering Technology program at New Jersey Institute of Technology are only a fraction of the national group. Therefore, the student's questionnaire was designed to be unpretentious in that it is neither national nor New Jersey oriented in scope. Second, the questionnaire that was chosen for the engineering firms is appropriate for and reflects or samples distribution.

However, the cross-section has two limitations based on the writer's selection of these recruiters. None of the questionnaires was mailed to small engineering oriented firms and few were mailed to non-engineering oriented businesses.

One very pertinent limitation to this study lies in the fact that little research has ever been conducted and written about the recruitment of engineering technologists with baccalaureate degrees. Also, as in most surveys, the response was not 100%, nonetheless, in spite of these small imperfections, the study can yield valid information.

The writer was permitted franking and telephone privileges by the New Jersey Institute of Technology's Director of Placement, Mr. John Schmid. Fortunately, this enabled the writer to remind some students and company recruiters of questions they had failed to complete on the reverse side of their respective questionnaires.

Assumptions

The principal assumption of this study is that the evidence from the questionnaires, the interviews and the little available data on the subject of engineering technology will demonstrate the necessity of engineering oriented firms to seriously consider the Bachelor of Science in Engineering Technology student as a sophisticated asset to the engineering world.

The secondary assumption lies in the fact that students do not have serious reservations concerning the recruiter's personal employment background. Whether the recruiter is or is not an engineer or engineering technologist is of little consequence to the initial interview on campus.

Method of the Study

This writer employed several methods to determine the

primary factors influencing employers' considerations of the engineering technology baccalaureate student from New Jersey Institute of Technology. One method dealt with the writer's direct observation of determined and concerned BSET students at the placement office at New Jersey Institute of Technology. A second method was the use of the Placement Office Survey for 1977 graduates of NJIT. The third, which entailed numerous hours of statistical correlations, was the analysis of Recruitment Questionnaires and Student Questionnaires (see appendix A and B) that presented the groundwork for the remainder of the study. The fourth method was the interviewing of some junior and senior BSET students, as well as straight engineering students and company recruiters. Fifth, research on engineering technology, placement services, college recruitment and pertinent comments as collected from libraries and other research sources was completed. Finally, the completed data was reviewed (see Chapter 4 for questionnaires) and interpreted.

Chapter 2

SURVEY OF LITERATURE

Understanding Engineering Technology and Its Objectives

Engineering Technology as a four-year college discipline is not new. In 1967, the Engineers' Council for Professional Development (ECPD) first accredited four-year degree programs in Engineering Technology, although the concept of four-year curriculum originated in 1957.⁴ New Jersey Institute of Technology has had the baccalaureate program for only five years. At NJIT a School of Technology actually does not exist; an engineering technology department monitors students that transfer into junior level standing at the Institute. Many technical institutes and community colleges in the country have had associate level engineering technician programs for many years. However, the field of the four-year engineering technology programs is relatively new to the Middle Atlantic area.

The Engineers' Council for Professional Development, an accrediting agency for engineering oriented programs in

⁴New Jersey Institute of Technology, Engineering Technology Department, Proposal to Offer a Full-Time Day Program Leading to the Degree of Bachelor of Technology [BSET] at Newark College of Engineering [NJIT] Starting Fall 1972 (Newark: NJIT Special Services, 1972), pp. 2-6.

institutions of higher learning, is very much aware of the growing dilemma of engineering technology. Their definition of Engineering Technology was designed to assist the business world in understanding the differences between the Technologist and the Engineer.

ECPD's Definition

Engineering Technology is that part of the technological field which requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities; it lies in the occupational spectrum between the craftsman and the engineer at the end of the spectrum closest to the engineer. Note: Industrial Technology should not be reported in this category.⁵

However, the BSET graduate or as the person is known in some colleges or universities, BET or Bachelor of Engineering Technology has not only the identity problem with the acceptance of his major in the engineering world, but also then realizes that the college recruiter is not knowledgeable about the four-year curriculum.

The term "technologist" has the connotation of "technician," yet each has its own distinction. The engineering technician is usually a person who has graduated from a two-year technical college level program (AAS degree) or has either completed training in a post-secondary technology certificate program or received valuable on-the-job training experience after several years. This person would have a good comprehension of engineering principles and practical

⁵Engineers Council for Professional Development, Thirty-Fifth Annual Report (New York: ECPD Publications, 1967).

skills and could effectively relate to others under the supervision of an engineer or ET, Engineering Technologist. Rarely would the technician authorize any alterations of projects or planned activity without prior approval.⁶

Although NJIT does not have the associate degree program, it does have, besides the baccalaureate program, a three-year evening certificate program. The Institute's Division of Technology certificate options are Architectural, Construction, Electrical, Mechanical and Plastics Technology. Among the programs objectives is the commitment to enrich technical employees' knowledge in engineering technology. The courses may be taken as individual units or as part of a structural three-year certificate program.⁷ When the student receives the certificate he has the choice of either transferring to a two-year college for the associate degree or entering the Institute's bridge program in order to matriculate into the junior year's engineering technology program. The certificate programs do not incorporate the humanities, social science or advanced technological courses, therefore by state law it is called a certificate, but the courses are in effect the equivalent to approximately three-fourths of an associate level technician's program without the aforementioned requirements.

⁶New Jersey Institute of Technology, Engineering Technology Department, Stop the World I Want to Get On (Newark: NJIT Special Services, 1975), pp. 1-2.

⁷NJIT Division of Technology Catalogue, 1977.

Again this person is the Engineering Technician. The Engineering Technologist, as ECPD has defined, is the graduate of a four-year baccalaureate program (BSLT). While there is a considerable difference between the Technician and the Technologist, the same does not hold true of the Technologist and the Engineer. Some company recruiters who understand the difference will often say that today's Technologist is yesterday's Engineer. The engineering curricula of years ago reveal many similarities. Certainly as the engineering technology curricula are expanded, the convergence will become even more obvious to those who understand the trend in today's engineering field.

Technology curricula stress the practical, short-sleeve aspects of engineering. Courses in drafting, for example, no longer required in many pure engineering curricula, are integral part of B.E.T. (sic) training. Faculty is chosen with an eye to practical experience rather than educational attainment; in many cases, courses are taught by practicing engineers.⁸

The Engineer is the planner or designer, the theory he receives in his educational studies is inclusive of the economic and social issues of man and his future. This implies that the Engineer must exercise judgments that transcend the issues of day to day technology. The training must not only be technically complete but also broad in terms of the future. The reader should then realize that the difference between pure engineering and engineering technology continues to be one of degree. The Technologist is geared

⁸Francis J. Lavoie, "Here Come the Technologists!" Machine Design, April 17, 1975, p. 76.

toward practical, applied engineering.

In 1972 the American Society for Engineering Education conducted a study of BS in Engineering Technology programs. They found that the average program had 130 semester credit hours, compared to 65 to 70 for a two-year associate degree. Twelve to fifteen credit hours of mathematics was another average; a course in algebra, a trigonometry course and two courses each in analytical geometry and calculus were also usual. At NJIT the students would also receive advanced courses in their options--Electrical Systems, Manufacturing, Mechanical Systems, Construction and Contracting, and Environmental. On the national average, twelve percent of these courses are geared toward mathematics. In its report the ASEE concluded:

It is not to be expected that these courses are taught with the same rigor or insistence on development of theorems and proofs as the calculus courses taught for engineering students.⁹

Their emphasis would be on the applications of the theorems and proofs as the student in technology is being trained to complete specific job requirements.

Ironically, the present dilemma has rejuvenated the old idea of requiring a Master's degree as the basic "professional" degree. No one knows if this will come to pass, "but the fact is that today some forty percent of engineering students go on to graduate study."¹⁰ Trends also indicate that

⁹Francis J. Lavoie, "Here Come the Technologists!" Machine Design, April 17, 1975, p. 77.

¹⁰Ibid.

within fifteen years, the average engineer will need the M.S. or possibly the Ph.D..

The Engineering Technologist, meanwhile, will suffer the same predicament as the overspecialized engineer if this happens. Educators have claimed that the advent of the technologist was to enable the engineering curriculum to concentrate on low-obsolescence training, such as science, mathematics, and basic analytical techniques. This emphasis was to maximize transferability for the engineering student, and eliminate the dislocations caused by the high degree of specialization that has characterized engineering. Unfortunately the BSET curriculum would then parallel the same overspecialized employment situation as engineering. The academicians solution is a familiar one: the need for continuing education.¹¹

Compounding the problem is the question of registration. Engineers, like accountants, have a separation of ranks; accountants who pass the CPA exam are called Certified Public Accountants. Engineers who pass the professional examination are called Professional Engineers, PE's. As is the case with the NTE's (National Teachers Examination) in certain communities, many engineers cannot practice their profession on some projects without the PE accreditation. BSET's do not share the same accommodation as their engineering brothers; some states, notably New York, disallow the

¹¹Francis J. Lavoie, "Here Come the Technologists!" Machine Design, April 17, 1975, p. 77.

technologist from taking the exam without additional experience. Unfortunately many BS Engineering Technology graduates take jobs that do not qualify as suitable experience.

This presents another dilemma as a committee of the National Council of Engineering Examiners has concluded that technology curricula are not geared toward the preparation of engineering design. Seemingly, that is one major difference between the technologist and engineer, design. As far as registration is concerned, it is assumed that the BSET holder will get little relief in the immediate future. Moreover, the examiners' committee has recommended that BSET graduates of an ECPD accredited four-year technology program be given a maximum of two years of educational credit toward registration. Employers who are aware of this and similar studies offer jobs of a less-than professional nature.¹² Most articles relating to this subject have been written by engineers and they reflect this bias.

The Evaluation and The Employer

While industry has had no problem delineating for itself the difference between the Engineer and the Engineering Technician, the same can not be said of the Engineering Technologist at the entry level of employment. The Engineer had a minimum of a four-year college education, and earned a clearly defined Bachelor of Science degree in disciplines

¹²Francis J. Lavoie, "Here Come the Technologists!" Machine Design, April 17, 1975, p. 78.

such as mechanical, chemical, electrical, civil or industrial. The technician may have earned an associate degree in Applied Science in a local community college or a technical school or may have achieved his position via an on-the-job training program. The Technologist must complete a four-year college program leading to a Bachelor of Science degree just as the Engineer does. The difference between the BSET and BS Engineer is not always clear even to the engineering community.

As the market grew both academically and from an employment standpoint, technicians realized that the career was a viable one that justified their education. For those who wanted more than the technician responsibilities, it was back to school in an engineering curriculum. All did not have the credentials nor mathematics interests to pursue a baccalaureate degree in engineering. Over the years industry was quite pleased at the fact that engineering schools emphasized production rather than research. Naturally, employment recruiters saw this potential, as they had always kept the communication channels open with the educational institutions. Many of the engineers were trained for jobs the technician could not attempt. The larger corporations, particularly those engaged in heavy research and development, began to realize that engineering was stagnating. All of this was happening during the last fifteen years, concurrently with our dwindling natural resources, energy blackouts and environmental abuses. The engineering student was then looked

upon for his research and development traits instead of production.

The educational community's reaction was the expansion of the technician's associate degree level experience into the four-year specialized programs of BSET.

According to George Grenier, the Engineering Technician would do well in transferring to an Engineering Technologist program. His educational background, if sound, would be an excellent starting point for a more advanced career.

Educational specialists refer to two kinds of learning transfer: (1) a lateral transfer in which one is capable of solving different problems of similar complexity to the original problem and (2) a vertical transfer in which one is enabled to do problems of greater complexity.

Lateral transfer capability is usually thought to be largely a matter internal to the individual. However, broadly based capabilities will be easier to transfer. Having gained the perspective of a wide variety of applications to a given theoretical construct, the technology student should be able to expand his capabilities into other constructs of equal complexity.

Vertical transfer requires absolute mastery of subordinate capabilities and these must precede vertical transfer. Again thoroughness of learning maximizes the student's capacity to solve more complex problems.¹³

College recruiters interview more Engineers because of the demands of their corporate headquarters, by emphasizing qualifications only an engineer could have, they then widened the field between the Technician and the Engineer thus creating the BSET person. However, some employers are

¹³George H. Grenier, "The Non-Terminal Nature of Engineering Technology Programs," Technology Today, I, No. 3 (January-February, 1977), p. 20.

not particularly excited by the advent of the BSET. Although the BSET program would allow them to place more engineers in research, industry always views the situation as an educator's folly. Seemingly, the chemical and energy conglomerates are taking the strongest stand against the engineering technology career. Employers as a whole, do not perceive the technologist as someone who is somewhere between the Technician and Engineer. In a 1972 survey of 4500 BSET's, some fifty-one percent had the word "engineer" in their titles; only fourteen percent were called "technologists," and fifteen percent were called "technicians," other titles filled out the remainder. Like the term "counseling," there is no clear, widely accepted definition of what is an engineer. Companies assign the title on the basis of the job itself. If the position is normally filled by an engineer, whether he has a conventional engineering degree or a BSET, more than likely the title will be "engineer."¹⁴

Salary

Obviously there is little support for the engineering technologist. However, the following survey conducted last year at NJIT indicates salaries that compare favorably with those offered conventional engineering graduates.

One of the reasons these salaries compare favorably lies in the fact that demand for a broader, more versatile

¹⁴Francis J. Lavoie, "Here Come the Technologists!" Machine Design, April 17, 1975, p. 78.

Table One

Comparative Salaries of Responding Graduates
(All BSET and Engineers from 1974-1976)*

	<u>1974</u>	<u>1975</u>	<u>1976</u>
Total number of BSET graduates	32	74	80
Responses with jobs	24	39	30 Day 15 Evening
Number unemployed	--	13	1 Day 2 Evening
Average salary, BSET	\$12,200	\$12,740	\$13,800 Combined \$12,760 Day \$15,856 Evening
Average salary, Engineering	\$11,940	\$13,164	\$13,891

type of engineering person is emerging. The person has to be more practical and theoretical at the same time. He may be an engineer who can perform in the areas that used to be reserved for technologists and technicians, or a technologist or technician who can perform in an engineering capacity when necessary. This may be a little disconcerting for the person who feels he is a "professional" and is above the routine technical aspects of engineering. It may also be a shock to the non-degreed technician and technologist who are moonlighting toward a degree with the principal objective in mind of leaving behind the technical aspects of their professions,

*Taken from the Spring 1977 B.S.E.T. Newsletter (NJIT)

while they move on to more diverse engineering activity.¹⁵

It is the feeling of the writer that the engineering technologist could do very well in this changing market. The salary charts certainly indicate this. Nevertheless, the overall economy and the supply of available engineers will be decisive. In addition, it is felt that the demand will also depend on how well employment recruiters are further educated on the special characteristics of the technologist. This has been the case in the Southwest, where the technologist is more familiar to employers. In the East the market is just opening up, so that the BSET student has to sell not only himself in the campus interview, but also the program as well.

What Do Recruiters Really Look For In Candidates?

Whenever students arrange to have interviews with some of the companies that come to NJIT, the most perplexing thought in their minds is how to impress the recruiter. What are these recruiters really looking for in graduating students? Many companies distribute literature concerning not only the company itself, but also the interview as well.

They advise the student to be selective about what he is applying for; the student would be foolish to suggest that he would take anything available. Also, the student should leave several resumes with his college placement office. Since most companies provide numerous reports and informative

¹⁵Joseph W. Price, "Providing Technical Support," Machine Design, December 11, 1975, p. 136.

materials about their respective businesses, the student is advised not to go to the interview "cold." Also casual clothing may be fine for everyday classroom attendance, but it definitely is inappropriate for the interview. In addition, the recruiter expects a well-groomed person. Being late is definitely a mark against the student; it is incumbent upon the interviewee to notify the placement office as soon as he realizes he will not be on time. Tardiness is not only a reflection on the prospective employee, but also on the college from which he is graduating. Recruiters expect the student to be somewhat nervous, but mumbling is not recommended. Questions from the recruiter about ambitions, experiences and activities are usual. The student himself is expected to ask questions related to the company's policies, promotions, benefits, and training programs.¹⁶

However, all these suggestions are not enough. It is the opinion of this writer that recruiters are often misled by their own company policies. The multiplicity of information required by the corporate office often negates any flexibility in an interview, that is, it disallows in depth discussions concerning students' past experiences or views. Sharing this information is important. Consider for example, the Vietnam-era veteran, who has had a valuable technological experience in the military. He submits to the recruiter, as do other students, his resume, references, and school

¹⁶"Your Job Search," Diamond Shamrock Corporation, 1977.

transcripts. The recruiter prepares a complete dossier on the student, yet often is uncognizant of the trends, skills and abilities which can be recorded on the company's recruitment dispatches. So, in effect, the recruiter may have sincerely listened to the student, but could not relate these values in the dossier because the company's policy overlooks the rating of such values.

Too often, raters are hastily briefed as to their counseling roles and inadequately informed as to the nature of skills and abilities expected in jobs included in their recruitment directives. Unless the recruiter is alerted to key areas considered important to his organization, acquisition of a mass of data about a candidate will hardly be meaningful to hiring officers.¹⁷

While the recruiter is unaware of what qualifications he is looking for, the student is unaware which of his qualifications he should stress. Incorporate into these doubts the biases, misnomers and misconceptions about a degree in Engineering Technology, and one realizes the perplexities of the interview for the student.

Studies on Interviewing Characteristics

Findings from field studies indicate that there are significant differences among business recruiters on interviewing characteristics. Hakel and Manne stated that campus interviewers attached top importance to scholastic standing even when the candidate had no relevant work experience or outside interests. Contrarily, Shell noted at an Illinois

¹⁷Harvey D. Tschirgi, "What Do Recruiters Really Look For in Candidates?" Journal of College Placement, December 1972-January 1973, p.76.

campus that grades were only important when other selection criteria were also acceptable.¹⁸

Employers and placement officers in a Midwest College Placement Association study rated personal data and relevant educational and work experiences higher than grades. At the San Jose Campus of California State University, recruiters regarded an outgoing personality, good character, and the ability to use good grammar as the most desirable attributes for a career in the world of business.¹⁹

In a global study of approximately 17,000 graduates included in the Bell System College Record File, their current salaries were compared with several undergraduate achievement criteria including scholastic attainments, and degree of college self-support. After reviewing study results, the investigators admitted that, 'none of the predicative indices received predict success with a degree of certainty that mandates its use to the exclusion of all else.'²⁰

It is obvious that most speculative studies which are designed to identify and classify certain traits of undergraduate job-seekers present misconceptions of the issue.

Dr. Harvey D. Tschirgi of the College of Business at Ohio University canvassed two hundred organizations in his college recruiters study. After they had visited the campus for recruiting purposes, respondents were mailed copies of the "Business Recruit Characteristics Questionnaire" which incorporated four key questions, each a cross-check on the

¹⁸Harvey D. Tschirgi, "What Do Recruiters Really Look For in Candidates?" Journal of College Placement, December 1972-January 1973, p. 76.

¹⁹Ibid.

²⁰Ibid.

other.

First, respondents were asked to rank eleven interview characteristics included in the questionnaire. They were given a five-point scale to rank the characteristics.

Secondly, recruiters were requested to identify those characteristics that they considered most relevant in the interview, regardless of whether such were incorporated in the first listing of ranked qualifications. Thirdly, respondents were asked to identify frequently recurring mistakes committed by college students in the interview. The last part of the questionnaire dealt with the problems newly hired graduates presented to the company.

Seventy business firms responded with usable questionnaire responses. Internal rankings were applied from a weighted averaging method for the eleven interview characteristics. Ranking and cumulative totals are shown in Table Two. The reader will note that grade point average, personal appearance, extracurricular activities, and work experience headed the list as generally important factors, while marital status, draft status, degree of self-support for educational expenses, and scholastic honors ranked relatively low.²¹ Based on the experiences of this writer with campus recruitment, the age range of recruiters is currently between twenty-five and forty-five years of age. This implies that the

²¹Harvey D. Tschirgi, "What Do Recruiters Really Look For in Candidates?" Journal of College Placement, December 1972-January 1973, p. 77.

majority of recruiters over thirty-five were not in the military during wartime years, therefore military service has a low value or none at all in their ratings.

When the company respondents were asked to alter their thinking from the survey's qualifications, a change in ranking was observed, as shown in Table Three. The most cited factor was one not included in the first questionnaire, the ability to communicate. Grade point average was in second place. Personal appearance as perceived by the recruiter ranked almost as high as personal work experience in Table Three and second only to student grades in Table Two, indicating its importance as a hiring factor.

Table Two
Factors Deemed Important in Hiring Interviews
(Forced Choice Listing)²²

Characteristic	Rank	Total Ranked Points	1
Grade point average (GPA)	1	252	
Personal appearance	2	243	
Extracurricular activities	3	239	
Work experience	4	233	
Geographic location preference	5	216	
Ability to state how recruitment can benefit organization	6	215	
Honors received	7	201	
Percent of college expenses earned	8	184	
Military service	9	175	
Draft status	10	174	
Marital status	11	107	

Respondents were asked to rate these characteristics according to the importance they attached to each in the initial interviewing effort: a rating of five meant the characteristic was deemed very important; four, important; three, of average importance; two, relatively unimportant; one, not important at all. Other factors receiving minor mention were draft status, percentage of college expenses earned, and references.

²²Harvey D. Tschirgi, "What Do Recruiters Really Look For in Candidates?" Journal of College Placement, December 1972-January 1973, p. 78.

Table Three
Factors Deemed Important in Hiring Interviews
(Open Choice Listing)²³

Characteristics ¹	Rank	Total Ranked Points ²
Communications skills	1	175
Grade point average (GPA)	2	136
Work experience	3	82
Appearance	4	80
Extracurricular activities	5	60
Location preference	6	43
Academic accomplishments	7	33

Respondents were asked to list the five most important characteristics considered in the initial interview situation in order of their importance. Unlike Table Two responses, respondents were not given pre-selected factors from which to choose. Total ranked points were determined by assigning respective weights to choices and by assigning respective weights of five, four, three, two, and one to factors which respondents supplied as being most important, second most important, etc..

²³Harvey D. Tschirgi, "What Do Recruiters Really Look For in Candidates?" Journal of College Placement, December 1972-January 1973, p. 78.

Dr. Tschirgi's study also points out that recruiters stated that many students come totally unprepared for the interview. The recruiter always expects the student to know something about the company and to ask relevant questions.

Most college placement offices, particularly at technological institutions, have a library of brochures and materials from company recruiters. In fact, in addition to reading the materials before an interviewing date, college seniors are encouraged to attend a series of "mock interviews" held on campus at the beginning of the academic year. Unfortunately, it is usually not mandatory for the students, so there is never one hundred percent attendance. And that one student who comes unprepared in the interview may influence the recruiter to view with a cautious eye all who follow. When a graduating senior displays an indifferent attitude toward the direction his career may take him, the recruiter's perceptions are often negative. On the other hand, as Dr. Tschirgi's report indicates, most recruiters were impressed with candidates who demonstrated problem-solving abilities, who stress long-range rather than short-ranged goals, and who indicated a willingness to assume responsibility.²⁴ These points lead the writer to believe that this study suggests that recruiters should focus their attention on perceptual rather than substantive data.

²⁴Harvey D. Tschirgi, "What Do Recruiters Really Look For in Candidates?" Journal of College Placement, December 1972-January 1973, p. 78.

Usually recruiters are more impressed with how well the candidate communicates with them in the interview than they are with the evidences of the students' achievement potential collected in dossiers, unless the grades, extracurricular activities, etc. are noticeably outstanding.²⁵

Tech students can develop these skills [communication] to the fullest and better prepare themselves for careers if they will consider their college education not just an opportunity for acquiring knowledge but a process for developing their self-initiative, leadership skills, and general ability to interact with people.²⁶

The Technical Graduate is Management Material

Liberal arts students are suffering the most of any current graduating college or university class. No doubt, some of this problem is attributable to the 1950's "baby boom" and the advent of the "computerization revolution." In her New York magazine article, according to Mr. P. Veruki, "The Job Market: The Class of '73 Need Not Apply," Caroline Bird illuminated the tragic plight of liberal arts graduates of various disciplines by pointing out several examples: 533,000 openings; 61,000 English and journalism graduates for 8,000 jobs; 5,000 anthropology graduates for 200 jobs, most of which required advanced degrees.²⁷ While the same figures

²⁵Georgia Institute of Technology, A Study - 1972: Factors Influencing Employers' Decisions to Further Consider College Graduates for Employment (Atlanta: Georgia Tech Placement Center, 1972) p. 2.

²⁶Ibid.

²⁷Richard A. Stewart and Peter Veruki, "Questions and Issues, How a Placement Director and Recruiter View Priorities," Journal of College Placement, Summer 1974, p. 37.

do not hold true for 1977 graduates, the numbers would support the same conclusions.

In the summer of 1974's Journal of College Placement, Mr. Veruki asks "who will educate the colleges and students if not industry?" His contention is that while industry is beating down doors to interview and recruit engineers, yesterday's liberal arts majors have quietly taken the top positions over the years. Engineers are supposed to be in these managerial positions instead. To take a better look at how these students make their careers climb and compare them to the engineering technologist, let us observe their strategies. One single observation that Mr. Veruki of Bethlehem Steel Corporation points out is that the college major is not the only success determinant in management. Intelligence, education, interests, motivation, ambition, timing, politics, and luck are factors that usually are parts of the "magic formula." Some of these factors are not foreseeable.²⁸

Mr. Veruki also contends that today's students lack vocational maturity; the interviews drift from any intelligent discussion, motivated questions, or career goals to superficial talk. He believes that more college relations work, not just recruiting, is necessary.

This is not the contradiction it may appear to be since management positions usually become available to tech-

²⁸Richard A. Stewart and Peter Veruki, "Questions and Issues, How a Placement Director and Recruiter View Priorities," Journal of College Placement, Summer 1974, p. 37.

nically-oriented personnel after five years of apprenticeship experiences. At Bethlehem Steel, over sixty percent of their new employees who participate in the Loop Course (educational/work program) go into steelmaking divisions. Apparently, many of yesteryear's liberal arts graduates at Bethlehem Steel and other major corporations made the step into managerial positions.

Veruki goes on to state that today's liberal arts graduates would be uncomfortable working half their waking lives in a hot, sometimes dirty, steel plant. Nor would they appreciate working next to employees with little education. Years ago this was the mode, not any longer.²⁹

It is this writer's contention that the above is a most questionable analogy and not for discussion in this paper. However, industry has yet to take a good look at the engineering technologist. Here, again as stated earlier, this "hands-on" type of employee is around. The engineering technologist is more production-oriented, and for the most part expects to begin his career much in the same way as yesteryear's liberal arts graduates did. The BSET graduate seems to be the happy medium, in some industries, between the conventional BA and BS graduate.

Entrance Level of GS-5 Engineering/Requirements

Although many states allow the Engineering Techno-

²⁹Richard A. Stewart and Peter Veruki, "Questions and Issues, How a Placement Director and Recruiter View Priorities," Journal of College Placement, Summer 1974, p. 37.

logist to take the Professional Examination for their PE certification, such is not the case with the federal government.

The primary method of qualifying for professional engineer position is through successful completion of a four-year professional engineering curriculum (Not Engineering Technology) leading to a bachelor's or higher degree in engineering in an accredited college or university.³⁰

The irony of that requirement lies in the fact that many industries acknowledge their BSET personnel as "engineer." Further, engineering technology is considered a part of engineering. The government's definition is diametrically opposite to their phrase, "leading to a bachelor's or higher degree."

The 1976 Placement Picture

The December 1976 Engineering Manpower Bulletin indicates that the 1976 campus recruiting year had a late spurt of job offers. Most of these reported jobs went to engineering and technology students; however, the writer's experiences with technologist recruitment slightly differs from the Manpower Bulletin. Technologists may have fared better than other students when the category was simply "job offerings," but more and better positions went to engineers. In the Middle Atlantic region, employers should not be acknowledged as having offered any substantially significant jobs to

³⁰U.S. Civil Service Commission, Engineering, Physical and Mathematical Sciences and Related Professions, Announcement No. 424, May 1976 (Washington: Government Printing Office, 1976).

technologists. The comparisons of professional positions to the actual number who graduate with a baccalaureate in engineering technology shows the number of graduates to be far in excess of the number of positions.

The Manpower Bulletin does point out that 1976 was one of the most discouraging years since the Engineering Manpower Commission placement surveys were started in 1958. At the end of 1976's academic year, fourteen percent of the engineering graduates and nine percent of the technologists were still seeking employment. The indication is that the BSET graduates did somewhat better than engineering graduates. Master's and doctor's degree engineering graduates and associate degree graduates in technology were also less likely to be without job offers than BS-engineers. Results are given in Table Four.

Starting salaries were up from 1975 by amounts varying between 5.6 and 7.9 percent. Engineering and technology graduates did well in comparison with the 5.4 percent increase in the consumer price index registered between July 1975 and July 1976. The best indicator of the employment situation comes from the combination of salary statistics, placement statistics and other significant data. Reduced recruiting activity, according to the Manpower Bulletin, does not necessarily lead to a comparable reduction in the salaries offered; however, it is the writer's experience that corporations tend to concurrently reduce recruitment schedules at schools that allow "pre-screening" of students'

resumes and other data. At present there is a national controversy, particularly among technological schools, as to whether the screening of job applicants is ethical. The Privacy Act (Buckley Amendment) prohibits this practice; however, industry has made inroads in beating the system. Their guise might best be classified as seeking the highest qualified graduates, for whom there is always strong competition among recruiters.³¹

While overall unemployment figures for engineers compiled by the United States Bureau of Labor Statistics showed rates of only 1.3 percent for the second quarter and 1.5 percent for the third quarter of 1976, the Manpower Bulletin indicates that, concern should be given about the prospects for the larger classes that will be graduating during forthcoming years, if the national economy continues to stagnate toward another recession.³² Whenever this happens, those from the technological disciplines suffer; generally speaking, the engineering technologist would be among the first to be terminated in many engineering firms.

B.S.-Technology Graduates Popular with Employers

Also contained in the Manpower Bulletin was a report that industry seems to be meeting the demand for a less theoretical, less scientific, more practically oriented kind of

³¹"Job Prospects for Engineering and Technology Graduates," Engineering Manpower Bulletin, No. 32, December 1976, p. 1.

³²Ibid.

Table Four

Placement Status of 1976 Engineering
and Technology Graduates³³

	Engineering Degree		Technology Degree		
	Bachelor	Master	Dr.	Assoc.	Bachelor
Employed, new	56%	42%	65%	49%	68%
Employed, returning to job	2%	17%	11%	9%	6%
Full-time study	18%	20%	3%	24%	6%
Other plans	7%	10%	12%	1%	6%
Considering job offers	3%	2%	1%	6%	5%
Seeking employment	14%	9%	8%	10%	9%

graduate, traditionally filled by engineers. The BSET is taking jobs in production, technical sales, inspection, quality control, construction, field service, detail design, and others. A decade ago there were about 1000 BSET graduates; that figure has grown to over 6500 graduates per year, and consequently has become a significant factor in the engineering profession.

³³"Job Prospects for Engineering and Technology Graduates," Engineering Manpower Bulletin, No. 32, December 1976, p. 3.

FIGURE I

Figure one graphs the placement picture for technologists during a nine year period. It is an up-and-down pattern similar to that of the engineers. However, the chart shows that technologists have a much smaller percentage of those who go on to advanced study. The number without job offers or other plans peaked at eleven percent in 1971, recovered to four percent in 1973, increased again to sixteen percent in 1975, and was down to ten percent in 1976. Not contained in the Manpower Bulletin were any reasons that account for so few engineering technologists not attending graduate schools.³⁴

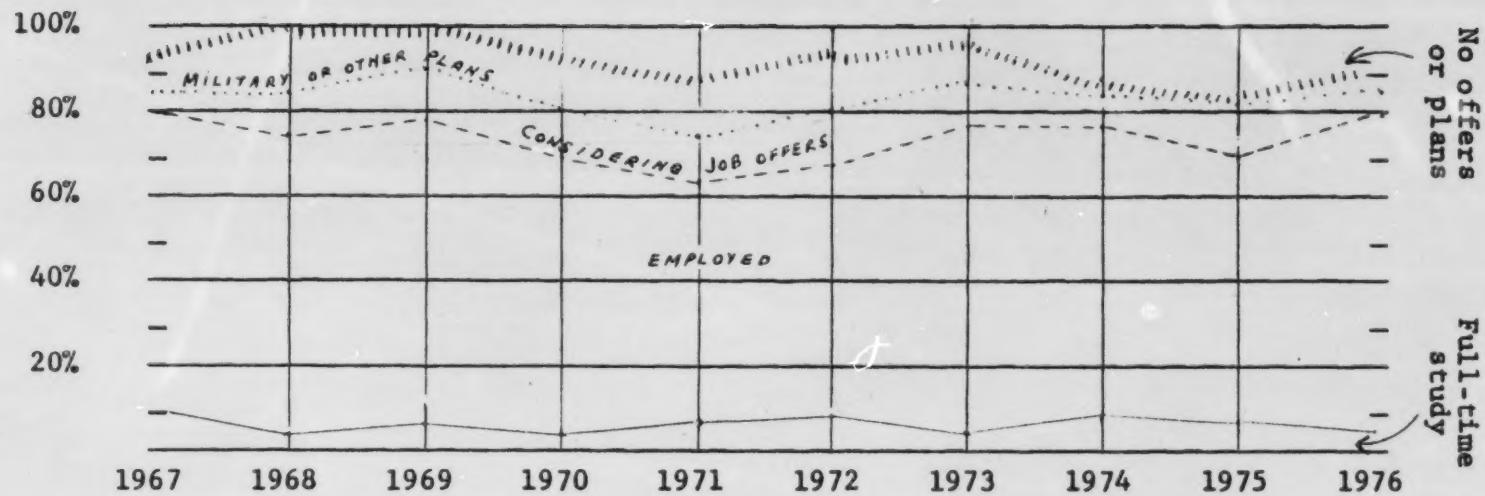
The simple truth is that the very schools that teach the undergraduate technologist often refuse to admit them to their graduate schools regardless of grades, experiences, etc.. Experience has told this writer that the lack of theoretical courses is the cause. One might suggest the respective colleges offer the necessary prerequisites as the solution, particularly if the students opt for a related engineering curriculum. No answer could be found to this question.

The percentage of graduates in Figure I considering job offers, i.e., having been offered one or more positions but not having made a final decision by the time of the

³⁴"Job Prospects for Engineering and Technology Graduates," Engineering Manpower Bulletin, No. 32, December 1976, p. 3.

Figure I

Placement Status of Bachelor of Technology [BSET] Graduates
1967-1976*



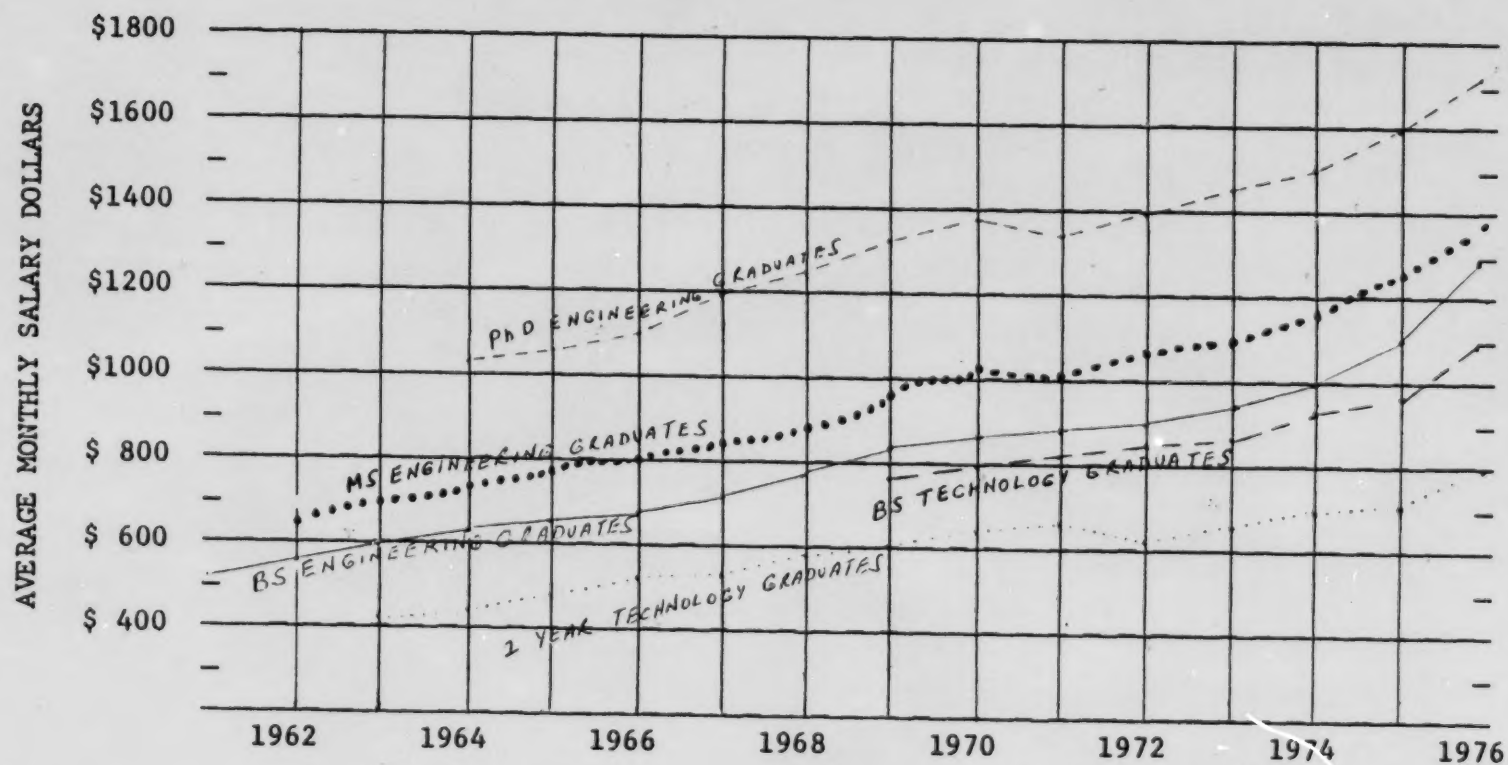
* Percentages read from bottom to top of figure

survey, has remained fairly constant. Evidence demonstrates that the number tends to decrease both in very good years and in poor years. In the good years, competition among employers and plentiful jobs are a plus because the graduate does not have to wait for an acceptable job to come along. In the poor years offerings are few, thus graduates take the first reasonable opening. In intermediate situations, with the demand only moderately strong, there seems to be a tendency for more graduates to delay any job offerings until a better job comes along.

FIGURE II

Figure two of the same Manpower Bulletin indicates that starting salary offers have generally risen over the years, however, increases were less pronounced during or immediately after years in which recruitment was lessened. Over the years the salary differentials among the degree levels has remained virtually constant. This implies that the percentage increase from one level to another has grown smaller with the passage of time. The widest gap is with the MS and Ph.D. degrees, while the bachelor of engineering technology seems to be maintaining the same curve as the conventional engineering degree. The reader should note that NJIT's BSET salary offerings in Table One compare favorably with the monthly starting salaries of 1976 in Figure II.

Figure II
Average Monthly Starting Salaries Offered to
New Engineering and Technology Graduates
1961-1976



Schools of Technology

The following listing will give the reader a sampling of schools around the country that offer the Bachelor of Science degree in Engineering Technology:

1. Bradley University, Peoria, Illinois.
Bachelor of Science in Construction, Electrical and Industrial Technology
2. Brigham Young University, Provo, Utah.
Bachelor of Science in Electrical, Mechanical and Industrial Technology
3. Capitol Institute of Technology, Boston, Massachusetts.
Bachelor of Science in Electronic Engineering Technology
4. Creighton University, Omaha, Nebraska.
Bachelor of Science in Medical and Radiologic Technology
5. Eastern Kentucky University, Richmond, Kentucky.
Bachelor of Science in Industrial and Electronic Technology
6. Embry-Riddle Aeronautical University, Florida.
Bachelor of Science in Aircraft Engineering Technology
7. Fairleigh Dickinson University, Teaneck, New Jersey.
Bachelor of Science in Industrial Technology
8. Florida A and M University, Tallahassee, Florida.
Bachelor of Science in Electrical, Mechanical, Civil and Industrial Engineering Technology
9. Geneva College, Beaver Falls, Pennsylvania.
Bachelor of Science in Medical Technology
10. Lowell Technological Institute, Lowell, Massachusetts.
Bachelor of Science in Construction and Plastics Engineering Technology
11. Milwaukee School of Engineering, Milwaukee, Wisconsin.
Bachelor of Science in Electrical, Mechanical, Architectural and Construction Technology
12. New York Institute of Technology, New York, New York.
Bachelor of Science in Mechanical, Industrial, Electrical, Aerospace, Computer and Architectural Technology

13. North Carolina Agricultural and Technical State University, Greensboro, North Carolina.
Bachelor of Science in Industrial Technology
14. Northern Arizona University, Flagstaff, Arizona.
Bachelor of Science in Civil, Drafting, Electronics, Mechanical and Industrial Technology
15. Northrop Institute of Technology, Inglewood, California.
Bachelor of Science in Aircraft Maintenance Engineering Technology
16. Ohio University, Columbus, Ohio.
Bachelor of Science in Industrial Technology
17. Oregon State University, Corvallis, Oregon.
Bachelor of Science in Civil, Construction, Industrial, Electrical and Mechanical Engineering Technology
18. Purdue University, Lafayette, Indiana.
Bachelor of Science in Computer, Construction, Electrical and Supervision Technology
19. Southern Illinois University, Carbondale, Illinois.
Bachelor of Science in Construction Engineering Technology
20. Texas A and M University, College Station, Texas.
Bachelor of Science in Industrial Technology
21. Trenton State College, Trenton, New Jersey.
Bachelor of Science in Electronic, Industrial and Mechanical Technology
22. University of Pittsburgh, School of Engineering, Pittsburgh, Pennsylvania.
Bachelor of Science in Civil, Mechanical and Electrical Engineering Technology
23. Wentworth College of Technology, Boston, Massachusetts.
Bachelor of Science in Electronic, Mechanical, Industrial, Construction and Management Technology

Chapter 3

THE BACHELOR OF SCIENCE IN ENGINEERING TECHNOLOGY DEGREE AND THE PLACEMENT PROGRAM AT NEW JERSEY INSTITUTE OF TECHNOLOGY

A View of the College

New Jersey Institute of Technology formerly named Newark College of Engineering, mirrors the past century's technological growth in New Jersey. The City of Newark's Board of Trade had been seriously considering a technical school since 1875; in 1881 the necessary legislation was enacted to provide state aid for technical education. The Newark board made preparations and soon the school came to be known as the Newark Technical School. In 1897, the school had to move from its overcrowded facility to the spacious quarters on the present site of the NJIT campus in Newark.³⁵

Originally the technical school was open only to Newark residents and the bulk of its funding came from the city, with a small amount from the state. The 1920's brought about the inevitable: students were mainly non-residents, and the city appealed for more state aid. At present, most of the public funds are from state allocations.

The school eventually came to be known as Newark

³⁵"History of The Institute," 1976-1977 NJIT Student Survival Handbook (Newark: NJIT Special Services, 1976), p. 5.

College of Engineering (NCE) and bachelors degrees were first offered in 1919.

During these early years the college was strictly an engineering school; however, after World War II the college expanded rapidly to meet its growing commitment to the state and nation. In fact many ex-servicemen began their academic careers at NCE, bringing about the first national veterans fraternity in the country, Alpha Sigma Mu, in 1953. These expansion years also brought about the College's Division of Technology Certificate Programs. As the 1970's came into NJIT's chronology, a more diversified technological spirit evolved. Degrees in Computer and Information Science, Industrial Administration, Man and Technology and even The New Jersey School of Architecture all fell under the NJIT umbrella.

The Engineering Technology program began in the Fall semester of 1972. The college officially changed its name from NCE to New Jersey Institute of Technology in January 1975. Presently NJIT offers certificate, undergraduate, masters, and doctoral programs to a student population of about 4900. Much of its student population is drawn from the Central and Northern New Jersey counties, although many students are transfers from other states. The college also has a large foreign student body who primarily are studying in the United States on student visas from European, Asian, Middle Eastern, African, South American and Caribbean countries.

The Undergraduate Division Curricula

New Jersey Institute of Technology offers varied curricula in engineering, architecture and related technology, and administration. The enrollments for these academic divisions, as of January 24, 1977, are shown in Table Five and Six. The reader is advised to note the following abbreviations:

Chemical Engineering	CHE
Civil Engineering	CE
Computer and Information Science	CIS
Electrical Engineering	EE
Engineering Science	ESC
Industrial Engineering	IE
Mechanical Engineering	ME
Architecture	ARCH
BS-Industrial Administration	BSIA
Man and Technology	M&T
BS-Engineering Technology	BSET

Analysis of the Curricula Distribution

There are some observations that can be drawn from the following data on departmental distribution. One observation is that there are relatively large numbers of day registration students (Table Five) in the more conventional engineering disciplines, notably chemical, electrical and mechanical engineering, three areas at NJIT in which college graduates find little difficulty in finding related employment in national economic-growth years. Another important

Table Five

New Jersey Institute of Technology
1977 Spring Undergraduate Day Registration Analysis*
(As of January 24, 1977)

	<u>CHE</u>	<u>CE</u>	<u>CIS</u>	<u>EE</u>	<u>ESC</u>	<u>IE</u>	<u>ME</u>	<u>ARCH</u>	<u>BSIA</u>	<u>M&T</u>	<u>BSET</u>	<u>U.D.</u> ¹	<u>NM</u> ²	<u>TOTAL</u>
Freshman	88	90	35	176	21	24	141	112	27	13	0	16	35	778
Sophomore	119	91	34	121	23	30	118	106	24	4	14	4	41	729
Junior	95	105	18	130	14	28	123	76	45	6	103	1	9	753
Senior	55	116	28	111	13	29	73	41	34	3	119	0	10	632
5th yr. Arch.	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>26</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>26</u>
Total	357	402	115	538	71	111	455	361	130	26	236	21	95	2918

*New Jersey Institute of Technology, Office of the Registrar, 1977 - Source of all enrollment statistics.

¹Undecided.

²Non-Matriculated, includes Newark-Rutgers Exchange Students and NJIT Graduate Students taking undergraduate courses.

Table Six

New Jersey Institute of Technology
1977 Spring Undergraduate Evening Registration Analysis
(As of January 24, 1977)

	<u>CHE</u>	<u>CE</u>	<u>CIS</u>	<u>EE</u>	<u>ESC</u>	<u>IE</u>	<u>ME</u>	<u>ARCH</u>	<u>BSIA</u>	<u>M&T</u>	<u>BSET</u>	<u>U.D.</u> ¹	<u>NM</u> ²	<u>TOTAL</u>
Upper Division	43	78	22	77	5	48	49	0	20	3	274	2	36	657
Lower Division	<u>16</u>	<u>45</u>	<u>13</u>	<u>65</u>	<u>5</u>	<u>15</u>	<u>57</u>	<u>0</u>	<u>13</u>	<u>2</u>	<u>0</u>	<u>6</u>	<u>38</u>	<u>275</u>
Total	59	123	35	142	10	63	106	0	33	5	274	8	74	932

¹Undecided.

²Non-Matriculated, includes Newark-Rutgers Exchange Students and NJIT Graduate Students taking undergraduate courses.

observation is the comparison of Tables Five and Six which shows that the Bachelor of Science in the Engineering Technology Department has no lower division category. The reason is that the Institute does not have a full-time day division for freshman and sophomore engineering technology students. As stated earlier in Chapter 1, the BSET students are admitted after attending a two-year community college or NJIT's evening certificate programs. Again, the certificate programs do not include the humanities, social sciences or advanced technology courses. Students here who desire to enter the Engineering Technology Department must complete these courses before full matriculation is given with junior standing. Presently, NJIT has pending a proposal to establish a separate School of Technology. This would enable students to begin a BSET program as full-time day freshmen. Finally, in conjunction with the theme of this paper, the reader should consider the specific options in Engineering Technology at NJIT. Table Seven will add further relevance as the total 1977 BSET graduating class is divided according to these options. The information was taken from the NJIT 1977 Placement Office Survey and the writer's own breakdown of the degree options, job offerings and accepted jobs.

An Analysis of the Options, Job Offerings and Accepted Jobs

Before analyzing the significance of the distribution, clarification must be established for the reader to understand the relationship between engineers and technologists from an employment standpoint. As mentioned earlier

Table Seven

Distribution by Option, Job Offerings and Accepted Jobs of the
1977 Bachelor of Science in Engineering Technology Graduates
at New Jersey Institute of Technology

	<u>Total Grads</u>	<u>Known Job Offerings by Recruiters at NJIT</u>	<u>Accepted Jobs</u>	<u>Percentages of Accepted Jobs</u>
Electrical systems	36	8	10	28%
Manufacturing	33	6	13	39%
Mechanical	24	17	12	50%
Construction and Contracting	52	3	14	27%
Environmental	<u>17</u>	<u>0</u>	<u>4</u>	<u>24%</u>
Total	162	34	53	33%

in this paper the technologist is trained from an applied, more practical academic viewpoint. The engineer's involvement comes after a detailed degree of theory and mathematics has been mastered for future planning and research. Both individuals could conceivably end up with the same employment position; however, the larger corporation will likely seek the engineer first and then the technologist, even though the position requires only a "hands-on" engineering sense. The options given in Table Seven are equated to engineering jobs as follows:

1. Electrical systems technology would parallel electrical engineering. The electrical engineer would have a concentration in the theory and application of electrical circuits which the technologist would not. The electrical engineer would also be concerned with the development and manufacture of new electrical devices.

2. Manufacturing technology parallels the industrial engineer. The industrial engineer would solve the problems of time, motion, men and management. The manufacturing technologist would emphasize those quantitative methods via production management.

3. Mechanical technology has an emphasis on the design of machines and systems while the mechanical engineer would have a wider variety of training in the design, development, manufacture and operation of more complex systems.

4. Construction and contracting technologists

specialize in various phases of the construction industry, in addition to field supervision; their civil engineering counterparts would deal more diligently with problems related to the health, safety, welfare and convenience of the general public. However, construction would not be their only forte, as water, sewers, transportation and urban planning, for example, are other directions that can be taken.

5. Environmental technology parallels to some degree civil engineering; however, their forte emphasis is the broad area of air, water, wastewater analysis and treatment, as well as management and design of environment-related processes and activities.³⁶

The most obvious significance of the distribution is that the largest class, construction and contracting, has one of the lowest percentages of job offerings. This can be attributed to the bleak picture in the construction industry in the Northeast. Civil engineers are experiencing the same unemployment problem as their technologist counterparts. Significant is the fact that twenty-seven percent (14) are employed, while only three known job offerings were made to the group. This implies that these positions were obtained from personal sources. The highest percentages, thirty-nine percent and fifty percent respectively, were in the Manufacturing and Mechanical options. These programs would relate to industrial and mechanical engineering positions. Students

³⁶NJIT 1976-1978 Undergraduate Programs Catalogue,
1976.

in these areas fared well in the job market this year. Electrical systems were notably significant as twenty-eight percent (10) of this group had accepted jobs, eight of which were job offerings. Thus, this group maintained the closest constant. The Environmental group seemingly had the most difficult time in seeking employment, twenty-four percent (4) had accepted jobs. None were offered via the placement office's recruiting periods, meaning that these positions were acquired through their own special efforts.

Comparisons of Table Seven and Table Eight

The thirty-three percent (53) figure of accepted jobs among BSET graduates in Table Seven falls below the 47.3% "Percent of Graduates Professionally Placed" in Table Eight. Also significant is the fact that only 55.1 percent of all undergraduate students placed utilized the college's placement services.

While this would mean that eighty-nine of the 162 BSET graduates utilized the placement service, only fifty-three obtained positions. Again this figure falls below the aforementioned 47.3%.

Analysis of Monthly Starting Salaries

Although Tables Nine and Ten do not breakdown the options in Engineering Technology, significance might be drawn from the fact that the average (\$1165) and median (\$1200) range compare favorably with the engineering disciplines for those students who were offered salaries. However,

Table Eight

New Jersey Institute of Technology
Placement Breakdown**

<u>PERCENT OF GRADUATES PROFESSIONALLY PLACED</u> (Includes Industry, Civil Service, Graduate School and Military)	47.3
<u>PERCENT PLACED - OF THOSE UTILIZING PLACEMENT SERVICES</u> (Includes Industry, Civil Service, Graduate School and Military)	55.1
<u>PERCENT OF STUDENTS ACCEPTING POSITIONS WITH COMPANIES OTHER THAN THOSE THAT RECRUITED</u>	7.4*
<u>PERCENT NOT ACCEPTING HIGHEST OFFER</u>	11.1*
<u>AVERAGE NUMBER OF INTERVIEWS PER STUDENT</u>	11.1*
<u>AVERAGE NUMBER OF OFFERS PER STUDENT</u>	1.01*
<u>PERCENT LEAVING NEW JERSEY</u> (Includes Private Industry, Civil Service and Graduate School)	18.6*
<u>NUMBER OF STATES REPRESENTED</u> (Private Industry, Civil Service and Graduate School)	20

*Based on Day Graduates taking interviews.

**New Jersey Institute of Technology, Placement
Office. Source of all employment statistics provided in this
paper, July 1977.

Table Nine

New Jersey Institute of Technology
1977 Graduates
Monthly Starting Salaries

<u>Private Industry Only</u>				
Day Students				
	<u>Lowest</u>	<u>Highest</u>	<u>Average</u>	<u>Median</u>
CHEMICAL	\$ 1300	\$ 1500	\$ 1405	\$ 1400
CIVIL	\$ 950	\$ 1300	\$ 1192	\$ 1200
COMPUTER SCIENCE	\$ 1050	\$ 1100	\$ 1070	\$ 1055
ELECTRICAL	\$ 960	\$ 1460	\$ 1250	\$ 1240
ENGINEERING SCIENCE*	\$ ----	----	----	----
INDUSTRIAL	\$ 1040	\$ 1310	\$ 1220	\$ 1225
MECHANICAL	\$ 1100	\$ 1415	\$ 1295	\$ 1300
ENGINEERING TECHNOLOGY	\$ 1000	\$ 1335	\$ 1165	\$ 1200
INDUSTRIAL ADMINISTRATION*	\$ ----	----	----	----
MAN AND TECHNOLOGY*	\$ ----	----	----	----
ARCHITECTURE*	\$ ----	----	----	----
ALL DEPARTMENTS**	\$ 950	\$ 1500	\$ 1280	\$ 1260

*No salaries listed due to small sample.

**All Departments -- are averages of all offers extended to all graduates. Totals are not averages of each departmental total.

Departmental averages represent all job offers extended for each department.

Table Ten

New Jersey Institute of Technology
Average Starting Salaries
1973-1977

	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>% Increase 1976-1977</u>	<u>% Increase 1973-1977</u>
CHEMICAL	\$ 977	\$ 1043	\$ 1199	\$ 1275	\$ 1405	10.2	43.8
CIVIL	\$ 897	\$ 962	\$ 1023	\$ 1030	\$ 1192	15.7	32.8
COMPUTER SCIENCE	\$ 880	\$ 933	\$ 983	\$ 986	\$ 1070	8.5	21.6
ELECTRICAL	\$ 925	\$ 997	\$ 1100	\$ 1110	\$ 1240	12.6	35.1
ENGINEERING SCIENCE*	\$ 958	\$ 987	\$ ---*	\$ ---*	\$ ---*	----	----
INDUSTRIAL	\$ 918	\$ 966	\$ 1025	\$ 1082	\$ 1220	12.7	32.9
MECHANICAL	\$ 937	\$ 1000	\$ 1089	\$ 1200	\$ 1295	7.9	38.2
ENGINEERING TECHNOLOGY	\$ ---	\$ 1016	\$ 1085	\$ 1091	\$ 1165	6.8	----
INDUSTRIAL ADMINISTRATION*	\$ ---	\$ ----	\$ ----	\$ ---*	\$ ---*	----	----
MAN AND TECHNOLOGY*	\$ ---	\$ ----	\$ ----	\$ ---*	\$ ---*	----	----
ARCHITECTURE*	\$ ---	\$ ----	\$ ----	\$ ---*	\$ ---*	----	----
ALL DEPARTMENTS**	\$ 930	\$ 995	\$ 1097	\$ 1158	\$ 1280	10.5	37.6

*No salaries listed due to small sample.

**All Departments -- are averages of all offers extended to all graduates. Totals are not averages of each departmental total.

Departmental averages represent all job offers extended for each department.

the reader should be advised that one-third of the BSET graduates found jobs in construction and contracting and environmental technology fields, and that salaries in these areas are not as high. Even so the average salaries compared favorably. In addition to this favorable information is the 6.8% salary increase between 1976 and 1977.

The Placement Office

The Placement Office at New Jersey Institute of Technology is primarily involved with the scheduling of liaison activities with corporate recruiters, as well as career planning, resume writing, and other job placement information services for students, faculty and businesses. The staff consists of a Director and an Assistant Director and two full-time secretaries. During the regular academic year there are NJIT work-study students who assist in the general office procedures.

Psychological counseling and vocational testing services are available at the NJIT Counseling Center.

The typical student who visits the Placement Office could be seeking a part-time or full-time position as well as information on the labor market. The majority are from the senior class. This writer, while assisting and advising students, noted that there were a few academic disciplines that suffered in the job market. Recruiters either had no job offerings in the student's major area of study or they simply refused to even consent to interviews. Notable among these problem disciplines was the Engineering Technology group. Their

frustrations convinced the writer that employment information was necessary from industry on the factors that influence the BSET's future.

The New Jersey Institute of Technology Student

The typical NJIT student is generally of middle-class background. He is a first-generation student in his family, whether he lives in Newark or the suburbs. Parents of such students look at college as a means of gaining socioeconomic mobility. Sociologists agree that this type of student would expect a college degree to broaden his opportunities in seeking employment. Education in the classical sense would not be the mode, as seeking a career takes a more intense precedence. Oftentimes the students find themselves perplexed in relation to the world of work and their futures. Some theorists regard this period of their lives as the Specification Stage (ages 18 plus); it is this stage that the individual, working on the basis of his choice, selects a particular job, profession or graduate school subspeciality.³⁷

DESIGNING THE QUESTIONNAIRES TO DETERMINE THE FACTORS THAT INFLUENCE ENGINEERING ORIENTED EMPLOYEES TO CONSIDER GRADUATES OF THE BSET PROGRAM AT NJIT FOR EMPLOYMENT

Designing the two questionnaires involved many hours of contemplation. The 293 corporate recruiters from around the country who maintained interviewing dates at NJIT during

³⁷Samuel H. Osipow, Theories of Career Development (New York: Appleton-Century Crafts, 1968), pp. 75-76.

the academic year received one questionnaire. The 162 Bachelor of Science in Engineering Technology students who graduated from the Institute received another. Both groups received cover letters from the writer briefly indicating the intent and importance of the study.

Selection of the Student Population for the Questionnaires

As a result of observing the frustrations and listening to the BSET students' employment complaints, this writer hypothesized that college recruiters do not understand the similarities between the training of technologists and engineers.

During the academic year the NJIT Placement Office arranged to have corporation/engineering-oriented college recruiters interview on campus. Part of this scheduling involved the recruiter advising the college as to what types of majors and functions he planned to consent interviews. At this point the student would sign-up for an interview, after perhaps a session in career counseling and the reading of the company's literature.

Since NJIT is traditionally an engineering college, and many companies view the school in that vein, the recruiters look primarily for the conventional engineer. Therefore, for example, whenever the recruiter advises the school of the particular function and engineering degree discipline, he expects only engineers to sign-up. It does not always happen this way; the mechanical technologists or the electrical technologists often sign-up as well, hoping to convince the

recruiter of their engineering similarities. Depending on the company, a few get job offerings at a later date; many leave the interview with mixed reactions. Although a couple of the NJIT major areas of study were also having difficulty seeking employment, the BSET's uniqueness to the engineering world and their related job frustrations led this writer to seek some answers.

Interviews With Some Students for Comments About the BSET Program

This writer interviewed six students to get a better perspective of the attitudes, ideas and general feelings about the college's engineering technology program. Those involved were from several disciplines. Only one student was a BSET, all others were seniors. Besides their impressions, and biases, this writer also elicited comments about the recruiters. Specifically, in the initial interview on campus, did it matter whether the recruiter was an engineer or engineering technologist?

The results can best be summarized from these quotations:

1. I didn't find out we had a BSET program until my junior year. No one at freshman orientation spoke to us about the program.
2. After speaking with some of my BSET fraternity brothers, I got the impression some of the companies around here didn't know about them. [BSET students]
3. I'm not sure I understand the technology programs versus the engineering ones.
4. Why aren't the environmental [BSET option] people getting jobs?

5. Even though I know a little bit more about the IET program [manufacturing option] I would still choose the IE program because of better job prospects.

6. A recruiter has to be foolish to look at just engineering talents. It wouldn't matter if the recruiter were an engineer or technical type person.

7. I went to Rutgers University and then a two-year college before coming here [NJIT]. The two-year college was geared more toward the technician, and since I had already two years of electrical engineering, that was not my goal. I heard about the BSET program, so I decided to apply and get my degree faster, since many of my courses were transferable.

8. Many of the instructors here have industrial backgrounds, and I like that, but never have I heard any of them use the term 'technologist,' always it's 'engineers' or 'engineering.' Kind of makes me feel left out. I think the technologist is probably more adaptable for an immediate job than an engineer.

9. Maybe a study should be made of BSET's who take the federal civil service exam. They [Federal Government] should not discriminate against technologists who feel they can master the exam. If there are any shortcomings to the technology programs, we'll find out in the study.

Analysis of the Interviews

Obviously there are mixed reactions among the student body at New Jersey Institute of Technology about the BSET programs. Surprising to this writer was the fact that the BSET interviewee (number 8) stated that the professors at the school had biases about the programs. Other BSET students who were informally interviewed agreed that the instructors never refer to the technologist in the engineering world.

Chapter 4

THE SURVEY

Preparation Phase

Several factors influenced this writer in developing the two separate questionnaires that were mailed to 293 employment recruiters and 162 graduates of the 1977 Bachelor of Science in Engineering Technology class at New Jersey Institute of Technology. The principal impetus came while observing BSET students' employment frustrations in the NJIT Placement Office. Statistics presented in this report indicated that there are underlying factors that influence engineering-oriented employers in their considerations to employ graduates of the college's engineering technology programs. The second impetus was to correlate these statistics with the literature in Chapter 2, and the writer's own experiences with recruiters. Finally, in an effort to define the comments, both negative and positive, it is anticipated that: (1) the information will be utilized to enhance the recruitment program at NJIT; and (2) the Engineering Technology profession will heed the realities of their graduates' job market.

The Design

After consultation with Mr. John Schmid, Director of

Placement at NJIT and Professor Joseph Kopf, Dean for Engineering Technology, the researcher originated and developed a list of survey questions that would elicit information from recruiters and BSET students. Ideas in the design and format of the questionnaires came from The Logic of Survey Analysis.³⁸ Although the researcher found little information on the subject of Engineering Technology, articles in the "Job Prospects for Engineering and Technology Graduates" in the Engineering Manpower Bulletin, in the December 1976 issue, were particularly helpful as a source of information and charts.³⁹

Mailing

Along with the questionnaires, a cover letter was designed to advise the students and recruiters of the purpose of the survey (see Appendices C and D).

The Questionnaires' Backgrounds

Chapter 2 dealt with the standard literature that surrounds the interviewing practices of businesses, in general. Technical careers, however, have their own uniqueness, as does education, business, law, medicine and other professions. In their uniqueness, they seek certain individuals to match a pattern of employment and behavior character-

³⁸Morris Rosenberg, The Logic of Survey Analysis (New York: Basic Books, Incorporated, 1968).

³⁹"Job Prospects for Engineering and Technology Graduates," Engineering Manpower Bulletin, No. 32, December 1976, pp. 1-4.

istics.

Engineering Technology does not exactly share the usual characteristics, since it is relatively new to the engineering field. As a result two questionnaires were distributed; one was mailed to BSET graduates, the other was mailed to the recruiters who interviewed various students during the recruitment periods at the NJIT Placement Office this year.

The two questionnaires contained questions that would elicit from students and recruiters their views of the problematic career area of engineering technology.

The principal goal of this writer was to design these questions so that some clarifications would emerge from the data, thus making it easier to diagnose the factors that influence the aforementioned recruiters.

The Students' Questionnaire

The questionnaire had four major divisions: Personal Data, Educational Background, Employment Background and Evaluation. The responses to the personal data are shown in Table Eleven. Of the eighty-two (50.6%) responses special attention should be given to the eighty male respondents, and to the fact that 26.4 percent was calculated as the mean age. The majority of these, twenty-four (29.3%) in the 23-26 age bracket and thirty-one (37.8%) in the 27-35 age bracket, were mainly students in the evening divisions. Tables Five and Six in Chapter 3 also indicate that more than half of all BSET students at NJIT are in the evening divisions.

Additionally, there are no freshman or sophomore levels at the college, only the Division of Technology's evening certificate level programs, which allow convergence of the certificate and upper level programs.

The third question in Table Eleven categorized the students according to their Engineering Technology option. The construction and contracting group, comprised the largest single unit, twenty-eight (34.1%) respondents. This is indicative of the construction class as a whole, it is the largest group and has had the worst experiences with recruiters. For the specific percentages of all five options, the reader is asked to study Table Eleven on the following page.

In the questionnaire's Educational Background Division, Table Twelve, questions 4a and 4b bring out two most interesting facts. Firstly, most students in the BSET program are transfers from two-year college curriculums. In addition 83.7% of those that did graduate with an associate degree (question 4b) did enter the program with an engineering or technological degree. The only exception was complemented by both the environmental technologists and that small percentage (16.3%) who matriculated into the program without an associate degree. It is also important to clarify that no New Jersey community college has a program in Environmental Technology. In addition the reader

Table Eleven

New Jersey Institute of Technology
Students' Questionnaire
Personal Data

26.4 Mean Age82 Respondents - Male=80; Female=0; Blank=2

Question 2:

	<u>Range</u>	<u>Total</u>	<u>Percentages</u> <u>"N"</u>
Age:	18-22	23	28.0%
	23-26	24	29.3%
	27-35	31	37.8%
	over 35	4	4.9%

Question 3:

	<u>"N"</u>	<u>Percentages</u>
Options:		
Construction and Contracting	28	34.1%
Electrical Systems	17	20.7%
Environmental	9	10.9%
Manufacturing	15	18.2%
Mechanical Systems	13	16.1%

will note the relationship to question 4c, "Are you a graduate of NJIT's Division of Technology Certificate Program?" Seven (8.9%) responded in the affirmative, while seventy-two (91.1%) replied, "no." Only one (1.3%) said, "yes" to the question, "Are you a graduate of any other four-year college?" Table Eleven gives the reader more specific information. The Employment Background, Table Thirteen, notes that as of April 6, 1977 forty-nine (60.5%) students were working in full-time (64%) and part-time (36%) positions. The reader should keep in mind that more than half of the BSET students were in the evening divisions, and the majority comprises Table Twelve's percentages. To the question, "What is your present job title?" thirty-seven (76%) of the forty-nine employed responded with the following job titles:

- Service Engineer
- Engineering Assistant (2)
- Quality Controls Supervisor
- Electrical Engineer
- Schedule Engineer Assistant
- Technician (2)
- Engineering Associate
- Research and Development Technician
- Tool and Dye Maker
- Assistant Engineer
- Power Director (in training)
- Salesman (2)
- Computer Program Instructor
- Assistant Engineer/Transportation
- Engineering Associate
- Gas Station Attendant
- Senior Quality Engineer
- Clerk
- Job Technician
- Loss Prevention Consultant
- Stock Boy/Receiving Clerk
- Electrical Mechanic
- Senior Technician
- Office Clerk
- Industrial Engineer (2)
- Senior Engineer

Table Twelve

New Jersey Institute of Technology
Students' Educational Background

Question 4:

- 4a. Did you transfer to New Jersey Institute of Technology from a two-year college?
- 4b. Did you receive an associate degree in an engineering or technological major?
- 4c. Are you a graduate of NJIT's Division of Technology Certificate Program?
- 4d. Are you a graduate of any other four-year college?

	<u>YES</u>	<u>NO</u>	<u>BLANK</u>	<u>YES&NO</u>	<u>% BLANK</u>	<u>% YES&NO</u>	<u>% YES</u>	<u>% NO</u>
4a	73	6	3	79	3.66	96.3	92.4	7.6
4b	67	13	2	80	2.5	97.5	83.7	16.3
4c	7	72	3	79	3.66	96.3	8.9	91.1
4d	1	76	5	77	6.09	93.9	1.3	98.7

Student Help
Cabinet Maker
Senior Technical Aid
Principal Technician
Production Worker
Office Engineer
Package Handler

The reader will note that when these questionnaires were mailed on April 6, 1977, approximately six weeks before graduation, of these forty-nine (60.5%) students, twenty-seven (55.1%) were employed in positions that were either assisting an engineer or had the word "technician" in their title. There were few engineers and no technologists listed in the fifty-two percent who answered in the affirmative to the question, "Are you anticipating a change of job in the near future?" Fifteen (30%) answered, "possibly."

Employment specialists also report that most people will change jobs at least once within a five-year span of their first position. As the reader takes cognizance of Table Thirteen, attention should be drawn to the fact that question 5c, "How long have you been working in the above job?" is not included in the table. Of the eighty-two respondents, the mean was calculated at 3.85 years, the mode at three years, the range from one month to fifteen years. Finally, Table Fourteen evolved from the "Evaluation" section of the "Students Questionnaire." The reader will bear in mind that the questionnaire was administered at the end of the NJIT recruitment periods. At the completion of the following ten questions, Table Fourteen will preclude the "additional comments." Responses are given in percentages; blanks

Table Thirteen

The 1977 BSET Students' Employment Background
at New Jersey Institute of Technology

Question 5:

a) Are you presently employed?

YES		NO		BLANK		YES & NO TOTALS	
#	%	#	%	#	%	#	%
49	60.5	32	39.5	1	1.3	81	98.7

Are you employed part-time or full-time?

FULL-TIME		PART-TIME		BLANK		TOTAL RESPONSES	
#	%	#	%	#	%	#	%
32	64	18	36	32	39	50	61

d) Are you anticipating a change of job in the near future?

YES		NO		POSSIBLY		BLANK		ANSWERED	
#	%	#	%	#	%	#	%	#	%
26	52	9	18	15	30	32	39.1	50	60.9

are excluded. Correlation of the subsequent comments and the nine evaluation questions will then follow in order:

1. When interviewing with engineering-oriented companies, do you feel it is necessary to sell the BSET program, besides yourself, to the recruiter/interviewer?

YES 82.3% NO 17.7%

2. Do you feel it makes any difference in the initial job interview as to whether or not the recruiter is an engineer or engineering technologist himself/herself?

YES 65.8% NO 34.1%

3. Have you felt the recruiters/interviewers did not quite understand the differences between your BSET curriculum and the BS-engineer's curriculum?

YES 84.5% NO 15.5%

4. Do you feel NJIT's engineering students are biased against the BSET program?

YES 57.9% NO 42.1%

5. Did you have an interview with any prospective employers in the NJIT Placement Office?

YES 51.3% NO 48.7%

6. Did you make any arrangements of your own to interview at a prospective employer's office?

YES 64.6% NO 35.4%

7. Have you had any job offerings?

YES 36.8% NO 63.2%

8. Are you considering full-time graduate school in September 1977?

YES 13.9% NO 86.1%

9. Has the engineering technology program at NJIT met all of your expectations?

YES 44.9% NO 55.1%

10. Additional Comments:

The first question in the evaluation section indicates the majority of the students as having to sell the BSET program, besides themselves. Sixty-five (82.3%) answered in the affirmative. Students comments were:

Recruiters did not quite understand the program,

sometimes I had to explain.

Recruiting companies on campus did not seem to fully investigate the BSET program thoroughly, and have definite prejudices against the capabilities of BSET's. Companies seem content with the traditional, straight, engineering disciplines and wish not to experiment with BSET's. The environmental program leaves much to be desired and hopefully improvements will be made starting in September. I think the program should be amended with a more appropriate title and more 'serious-minded' professors. Also selling yourself, a new program and a relatively unknown one at that, is a great undertaking for students alone.

To the second question asking if it made any difference "in the initial job interview as to whether or not the recruiter is an engineer or engineering technologist," fifty-two (65.8%) said, "yes," twenty-seven (34.1%) answered in the negative. Student's comment:

I have never met an engineering technologist who was a recruiter.

Of all the recruiters who visited and interviewed at NJIT during the recruitment periods, none were technologists. Moreover, as Table Fifteen indicates, almost half (44.1%) of the recruiters were engineers; and of these recruiters, all were engineers who usually were interviewing students for the first time, for only a few days out of the year. However, the crux of the problem addresses itself to the interview. As such, the student would experience a more relaxing interview if the recruiter knew something of the BSET professional as well as being devoid of an engineer's "snobbery."

The third question, "Have you felt the recruiters/interviewers did not quite understand the differences between your BSET curriculum and the BS-engineer's curriculum?" an

Table Fourteen

Students' Questionnaire - Evaluation

N=154

Question:

1. When interviewing with engineering-oriented companies, do you feel it is necessary to sell the BSET program, besides yourself, to the recruiter/interviewer?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
65	82.3	14	17.7	3	3.7	79	96.3

2. Do you feel it makes any difference in the initial job interview as to whether or not the recruiter is an engineer or engineering technologist himself/herself?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
52	65.8	27	34.1	3	3.7	79	96.3

3. Have you felt the recruiters/interviewers did not quite understand the differences between your BSET curriculum and the BS-engineer's curriculum?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
60	84.5	11	15.5	11	13.4	71	86.6

4. Do you feel NJIT's engineering students are biased against the BSET program?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
44	57.9	32	42.1	6	7.3	76	92.7

5. Did you have an interview with any prospective employers in the NJIT Placement Office?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
41	51.3	39	48.7	2	2.5	80	97.6

Table Fourteen (continued)

Question:

6. Did you make any arrangements of your own to interview at a prospective employer's office?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
51	64.6	28	35.4	3	3.7	79	96.3

7. Have you had any job offerings?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
28	36.8	48	63.2	5	6.2	76	93.8

8. Are you considering full-time graduate school in September, 1977?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
11	13.9	68	86.1	3	3.7	79	96.3

9. Has the engineering technology program at NJIT met all of your expectations?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
35	44.9	43	55.1	4	3.8	78	96.2

overwhelming sixty students (84.5%) answered in the affirmative. Note these students comments:

I believe the basic problem with the BSET program is that prospective employers are not fully aware of the BSET program and generally regard it as inferior to the engineering program. We don't claim to be engineers, but we do have special skills that should be made a little more clear to prospective employers.

In my interviews I get the feeling the interviewer does not believe we can handle the prospective job

During my interviewing process I have found the BSET graduate well received in the area of sales and service, once the program was thoroughly understood by the interviewer.

In the few interviews I have been to, the interviewers have never been engineers, but the person knew what he wanted in the way of personnel. If you made it past the first preliminary interview, you are then interviewed by the senior engineer or another engineer from the department you would be working for. Their decision is usually final.

Some did and some did not.

To the question, "Do you feel NJIT's engineering students are biased against the BSET program?" the answers appear almost evenly divided, forty-four (57.9%) said, "yes," thirty-two (42.1%) said, "no." The writer incorporated this question because many of the biases or misconceptions that recruiters have about the BSET program seem to filter down to the engineering students. This fact and the poor job market has created a rift among the student disciplines. Students comments were:

. . . It is discouraging and if I had to do it all over again, I would have chosen chemical engineering as a major. These people are getting the majority of the job offers

I feel there is a big difference between engineers and engineering technologists. Engineers tend to deal

more with raw theoretical concepts and tend to be more creative, and technologists deal more with practical working knowledge and putting it to use.

Who gives a, really?

The next two questions dealt respectively with the students interviewing in the NJIT Placement Office, and making these arrangements to interview on their own. The percentage of "yes" to question five, forty-one (51.3%) parallels closely the overall day graduating class who utilized the placement services, as given in Table Eight. Ironically, the fifty-one (64.6%) students who sought interviews on their own were mainly full-time day students, and appear not to have had the same edge as their evening counterparts who were at least employed at some level. Question seven, "Have you had any job offerings," forty-eight (63.2%) said, "no." Note students' comments:

. . . In reference to on-campus interviews, I feel that many companies which participate in the recruitment process are not there to hire at all. This is the feeling which I got from taking interviews through the placement office. I had two interviews at the beginning of March

As of the present I have yet to receive any follow-up or any response from either company. I feel that there is very poor public relations between these companies and employee-prospects, and this does not tend to influence students to participate with your department.

Most companies were more concerned with my lack of work experience in the engineering world.

The environmental technology program should offer more math and biological science programs which I feel would be beneficial to the program. Currently I have found it difficult even to find a prospective employer.

I never got my money's worth by a long shot. Most work was done on my own. It seems that throughout the first year in the Environmental program, all students

were duped into believing that job opportunities would be numerous upon graduation. Actually, just the opposite is true, not due to the students' failure to seek opportunities, but on the part of the school. Not enough advertising had been done to try and bring companies to interview with the Environmentals and the whole BSET program. I must admit though that the Placement Office was cooperative after the fact and supplied us with numerous prospective employers.

To the question, "Are you considering full-time graduate school in September, 1977?" sixty-eight (86.1%) said, "no." Aside from the BSET's employment aspirations, few colleges offer continuation programs on a graduate technology level; unfortunately NJIT also does not have the program.

As a technology student, I feel that the structure of the program should have been such that there would be easier admittance in graduate school. The program I feel lacks mathematical courses.

In most cases, when the BSET student decides to enter graduate school, it usually is in a non-technical/management area. Thus, although his "applied" background is somewhat controversial, all is not lost on a graduate level, if the student enters a management program.

It was the writer's intention to place the question, "Has the engineering technology program at NJIT met all of your expectations?" last in order to elucidate the problems encountered primarily in the job placement area. Comments were expected from an employment vein in the "Additional Comments" section. First, however, among the results distributed, thirty-three (55.1%) replied to the contrary. Correlation here can be equated to question five, in that forty-one (51.3%) students answered as having taken an interview at the placement office; question seven's follow-up regarded the job

offerings, if any. Forty-eight (63.2%) students responded with a "no" to the question. Apparently, the percentage who arranged for placement-oriented employment were satisfied. Secondly, at least part of question nine can be attributed to this opinion, as the same trend exists among all graduation students who utilized the placement office. In other words, the BSET program does have an identity dilemma among many major companies. However, when the student persists and he regards the placement service as vital to his career, engineering technology positions do come along.

Surprising to this writer were the solicited comments to the last section "Additional Comments." The problems related by the BSET students did not only entail the employment scene, but academic as well.

Professors seem to keep stating that we will get jobs as "technologists." Companies don't want technologists but engineers.

I feel that a program should be tested for its feasibility at obtaining employment before it is instituted. Since jobs are scarce for us, I feel that the program should be reviewed and changes should be made to what expectations employers are looking for.

I feel many instructors were not sure on what level to teach the material.

I think the BSET program (especially the environmental option) is doomed unless drastic action is taken to improve the curricula. Courses such as computer programming and social science electives are useless, because they are taught by incompetent "professors." If NJIT is to achieve, it must begin by having teachers in the classrooms not apathetic engineers and chemists. Also, no practical knowledge is gained from these courses. Most students are more concerned about getting a passing grade than in learning anything from the course. It seems that most instructors at NJIT are there to kill some time between their research projects or their private consulting businesses. As far as the

placement office is concerned, I think it did a piss poor job of spreading the word around to prospective employers about the BSET program.

What is a 'Hands-on Approach?' I have gained more hands-on experience in the community college that I attended and we had well equipped shops. One credit to the NJIT program is that the students have been exposed to a substantial number of industrial related field trips. I feel that these trips were very beneficial in giving us a broad scope of industrial life and future expectations in today's working environment.

Courses in the BSET program should be more advanced or allow students to take more BSET electives, if qualified. Some of the courses were a repeat of courses taken at I feel that my two years at . . . prepared me for a career better than the BSET. I am an evening student and have heard these complaints repeated by others.

The Recruiters' Questionnaire

The second questionnaire was administered to 293 employment recruiters. The overall response was commendable, 154 received or 52.6%. Contained within the questionnaire's (see Appendix A) "Personal Data" division were: Name, Title, Company's Name, Present Age, Educational Background and Employment Background. The "Evaluation" division had eleven questions and a comment section. Of the 154 responses, 137 (89%) were male and thirteen (8.4%) were female. The mean age was 38.8 years, the majority, ninety-five or 61.7% were in the "26-39" age bracket. Their titles ranged, for example, from Manager/College Relations to Manager/Production Design Engineering. In fact, one startling response to this writer was the fact that almost half the recruiters were technical people instead of management/personnel individuals, as expected. To the question, "Are you an engineer or engineering technologist?" eighty-four (56%) (see Appendix G)

answered in the affirmative, for the specific percentages of all the "Personal Data," the reader is asked to study Table Fifteen on the following page. To the question, "Are you anticipating a change of job in the near future?" the majority or 106 (71.6%) answered, "no" and twenty-seven (18.3%) said, "possibly." The mean to the question, "Approximate number of years in company" was 6.7 years, range was four months to thirty-five years, the mode was one year. Relative also to the "number of years in professional recruitment" was a mode of one year and a mean of 4.7 years.

Obviously then the majority of recruiters are in their twenties and thirties, and typically are required to have only a baccalaureate degree. In addition, the recruiter has professionally recruited with the same company from one to six years. Knowing this information, the average recruiter has been around engineering technology's growing pains for a reasonable amount of time. Moreover, if the recruiter attended a technological institution, there is a very strong possibility, he graduated along with engineering technologists.

Recruiters' Evaluation

Recruiters were requested to check either yes or no to the following questions. Responses are given in percentages; blanks are excluded.

1. Does your company employ any Bachelor of Science in Engineering Technology, BSET, graduates?
 YES 57.2 NO 42.8

Table Fifteen

Recruiters Questionnaire - Personal Data

N=154

52.6% Response

	<u>Number</u>	<u>Percentage</u>
<u>Sex</u>		
Male	137	89.0
Female	13	8.4
Blank	4	2.6
<u>Age</u>		
20-25	14	10.0
26-39	95	61.7
40-45	18	11.7
Over 45	25	16.2
Mean Age	38.8	
<u>Educational Level</u>		
1-2 years college	2	1.3
BA, BS degree	85	55.2
Post-secondary professional or technical school	2	1.3
Masters degree	41	26.6
Graduate work beyond masters	15	9.7
Doctorate	7	4.5
Blank	2	1.3

2. Were you involved in the recruitment of this employee?

YES 49.6 NO 50.4

3. Are you an engineer or engineering technologist yourself?

YES 44.1 NO 55.9

4. At engineering schools do you feel it is an asset for the recruiter to be an engineer or engineering technologist in the initial recruitment interview on campus?

YES 56.0 NO 44.0

5. Are you aware of the difference between the technologist and the engineer?

YES 88.3 NO 11.7

6. Do you consider the engineering technologist as having attained the same professional level as an engineer in a similar discipline?

YES 33.3 NO 66.7

7. In your opinion, do you feel the engineering technologist is meeting the needs of industry?

YES 81.7 NO 18.3

8. In your opinion, do engineering firms in general consider the BS-in Engineering Technology degree something less than professional?

YES 67.5 NO 32.5

9. All areas considered, would you offer an engineering technologist

- A. Lower starting salary as an engineer?
- B. Higher starting salary as an engineer?
- C. Same starting salary as an engineer?

A. 60.6 B. 0 C. 39.4

10. What title(s) does your company give the engineering technology graduate?

Of the 131 who responded, 38.9% gave titles, 16.8% did not know of any titles, 44.3% had no titles.

11. What other colleges or universities do you recruit at for graduates of the Bachelor of Science in Engineering Technology programs?

Responded: 38.9%

12. Additional Comments: _____

Responses to the first nine questions are shown in Table Sixteen (Appendix G). Questions ten through twelve and quotes are incorporated in the "Analysis of the Recruiters Evaluation."

Analysis of the Recruiters' Evaluation

The first question requested the employment recruiter's company as employing any Bachelor of Science in Engineering Technology graduates. Eighty-three (57.2%) answered in the affirmative. This also correlates with the responses to question ten's, "What title(s) does your company give the engineering technology graduate?" Although these responses are not in table form, the researcher has computed these totals: (1) Of the 131 responses, fifty-one (38.9%) gave a title; (2) Fifty-eight (44.3%) replied, "none" or "N/A;" (3) Twenty-two (16.8%) replied with, "don't know."

Note, we don't hire engineering technology graduates at all.

Not to the best of my knowledge.

No appropriate positions at this time.

We do not actively recruit graduates with technology degrees; however, if the college has this program, the recruits are interviewed and evaluated equally with engineering graduates.

We do not recruit BSET's because we are less 'hands-on and more theoretical.' BSET's in federal Civil Service receive a GS-5 rating. We are bound by Civil Service regulation. It is unfortunate, however, the federal government prefers the engineering graduate.

To the second question, "Were you involved in the recruitment

of this employee?" the 121 responses showed an even range, sixty or 49.6% said, "yes," sixty-one or 50.4% said, "no."

I interviewed three of your BSET in Construction and Contracting and was very impressed with the quality and maturity of these individuals.

As mentioned earlier, sixty-five percent of the students replied that it made a difference as to whether the recruiter was technically-oriented in the initial interview. Apparently, recruiters themselves are almost of the same opinion. Eighty-four or fifty-six percent acknowledged in the affirmative, while only sixty-seven or 44.1% were actually engineers. It was the writer's opinion that the students, BSET students specifically, would rather have a technically-oriented person because he was expected to have some understanding of their expertise. Experience dictates that the most knowledgeable recruiter of any college's curriculum diversity usually receives a warm reception from students regardless of his educational background.

Your question !question four should be expanded to technically trained. I have an MS in Physical Chemistry and have worked as a process engineer, a production supervisor and in R & D. Yes, background is important for the recruiter. He should know where the student is coming from and where he will likely be in his initial assignment.

Regarding the question, "Are you aware of the difference between the technologist and the engineer?" the majority or 128 (88.3%) responded in the affirmative. However, question eleven dealt with the recruiter naming other colleges, where they recruited BSET graduates. Fifty-one or 38.9% actually did name some but six recruiters (4%) cited colleges

that were strictly engineering schools. This indicates that at least 38.9% of the respondents actually do know the difference between the two programs. Six or 4% did not know the difference. Some knew they did not know.

I have scant knowledge of the Engineering Technology degree people, so can draw no conclusions.

Although I have a sketchy idea of the difference between the technologist and engineer, it is not clear to me what the vocational difference is, i.e. what types of engineering function can the technologist perform? I have the impression he is qualified for less functional types of positions. We have never recruited specifically for BSET graduates, but are willing to talk to them; in my opinion recruiters understanding of the objective of the BSET program is poor. I would suggest a selling job on the advantages of that type of degree to your recruiters. Otherwise, the BSET graduate will remain at a disadvantage in the recruitment process.

I really would like to know more about the Engineering Technology degree. Please send me any available information.

The dichotomy of responses to questions six and seven leave no doubts as to the prejudices industry has against the engineering technologist. Specifically, to the question, "Do you consider the engineering technologist as having attained the same professional level as an engineer in a similar discipline?" of the 135 responses, ninety recruiters (66.7%) said, "no." Compare question seven, "In your opinion, do you feel the engineering technologist is meeting the needs of industry?" Of 120 responses ninety-eight or 81.7% said, "yes." Obviously, this implies that industry, via recruiters, has acquiesced to the field of engineering technology, however, there appears to be a reluctance to attach any "professional" nomenclature. Consider also question eight, "In your opinion

do engineering firms in general consider the BS-in Engineering Technology degree something less than professional?" Eighty-three (67.5%) of 123 respondents said, "yes." Adding validity to their opinions is the fact that eighty (60.6%) respondents, of a total 132, said they would, "offer an engineering technologist (question nine) a lower starting salary." None (0%) responded with a "higher starting salary" and fifty-two (39.4%) said, "same starting salary." The twenty-two respondents who left the answer blank correlated perfectly with the same number of "don't knows" in question ten's dealing with the naming of titles.

The following were some of the responses made to question ten:

1. Jr. Engineer or Engineering Tech.
2. Engineering Technologist
3. Technical Engineer
4. Same as Engineering Graduate
5. Engineering Technician
6. Engineering Assistant, Senior Engineering Assistant, Engineering Associate
7. Engineering Trainer
8. Supervisor or Project Engineer
9. Service Engineer
10. Product Supervisor, Technical Supervisor
11. Staff Engineer
12. Field Engineer
13. Trainee Titles
14. Trainee in loop course, same as engineer

15. Entry level engineers
16. Probably engineer, not hired in research center
17. Engineer or Chemist, depending on job
18. Electronic Technologist
19. Depends upon the job
20. No difference in title

The problem is one of semantics rather than talent. Unfortunately status conscious,, traditional engineers appear unwilling to accept a technologist as a capable engineer when in reality the technologist is probably better able to handle contemporary technical problems than the old line, traditional engineer.

It is up to the college offering this degree to make industry aware of what an engineering technologist is equipped to do.

I am a systems programmer and not involved everyday with recruiting.

I believe the Engineering Technologist has been misguided and shortchanged. The university is doing the person a disservice to encourage him or her to become a technologist instead of an engineer.

I believe a technologist may advance as well as any other engineer if he enters management. If he remains in technical work, his possibilities are more limited. I believe an engineer (conventional) does not have such a limitation.

As long as those in top management positions are engineers, technologists will be treated as second class citizens.

We do not actively recruit graduates with Technology degrees; however, if the college has this program, the recruits are interviewed and evaluated equally with Engineering graduates.

While we have no prejudice/bias against an ET graduate, I'm sure some of the EE's would. Our engineers are about 90% EE's in my particular division. In our other division, where there are more hardware-oriented projects, the ET would rank equally or maybe even higher than the EE.

I am not a recruiter. It appears to be my company's

policy to press an engineer into service when the recruiting schedule is at a peak. As a graduate of NJIT, I was assigned to my one and only recruiting job.

I personally was aware of NJIT's BSET program, and our professional recruiter must know also, but I don't think the department heads who make up the manpower requirement lists are aware of BSET's or their capabilities. I know we needed construction personnel, but the manpower sheet for that department listed only engineers - the BSET column was blank.

After talking to a number of BSET grads who specialized in construction I became aware that these people had ideal backgrounds for our field construction division. I would suggest a massive advertising/information program directed at middle management (not at recruiters) to let them know what they are missing out on.

Chapter 5

SUMMARY AND RECOMMENDATIONS

Having been initiated by serious problems of the BSET students attending job recruitment campus interviews, this study reviewed the literature on the BSET programs; compared the functions of the technician, technologist and engineer; examined the BSET program at NJIT; and surveyed some NJIT students (163) and employment recruiters (293) who conducted campus interviews.

Due to the relatively short time the BSET program has been in existence, the literature was understandably scarce. While much of it seemed to give a negative picture of the technologist, it should be noted that many of the articles were written by engineers. Indeed, a closer reading showed the articles did contain a fair idea of the role of the technologist. It was the condescending tone of the article, not the facts, which provided the negative view.

Unfortunately, the survey found that the campus recruiters, a majority of whom were engineers, held the same condescending attitude toward the technologist and that they and their middle management lacked an understanding of the technologist's functions. It is little wonder then that the BSET student left the interview with not only no prospect of

a job but also a rather low opinion of the program, in the student survey. Unfortunately, the survey also discovered that the feeling was only reinforced in the attitude of the classroom instructor at NJIT, also a large proportion of whom are engineers. Since the lines of communication between the university and corporation were found to be working, the problem seems to be a corporate one. The information being exchanged by executives on both sides is not being adequately appreciated by those in direct contact with the student/technologists.

One very encouraging statistic pointed out that while the technologist student did not do as well at campus interviews as the engineering student did, he did do well when he approached the corporation. He was perhaps then meeting different personnel or perhaps was selling his program as well as himself.

In any case, the fact that the survey points out that 60% of the technologists surveyed have been technically employed for approximately four years, dramatically emphasizes the usefulness of the program.

In light of the data assembled, this writer would like to suggest the following:

1. An intense dialogue concerning the usefulness of the technologist should be established between the campus recruiter and his corporation's upper management.

2. Workshops which classify the career of the technologist should be offered by NJIT to its instructors.

3. Students in the BSET program should be allowed the option of taking more theoretical and conventional engineering courses.

4. Technical experience gained in the military or industry should be evaluated, via testing, for college credit.

5. Graduate work should be accessible to the BSET at NJIT.

6. Serious consideration should be given for establishing discussion with the federal government about its policy of disallowing BSET graduates professional engineer positions.

7. A full four-year engineering technology program should be instituted at NJIT to project a better image of the technologists' capabilities.

8. NJIT should annually survey a portion of its BSET alumni to discover the needs to keep the program viable in a changing society.

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APPENDIX A

BACHELOR OF SCIENCE IN ENGINEERING TECHNOLOGY
RECRUITMENT QUESTIONNAIRE

April 6, 1977

NEW JERSEY INSTITUTE OF TECHNOLOGY
NEWARK, NEW JERSEY 07102

BACHELOR OF SCIENCE IN ENGINEERING TECHNOLOGY/RECRUITMENT QUESTIONNAIRE

PERSONAL DATA

1. Name: _____ Title: _____
2. Company's Name: _____
3. Present Age: 20-25 ____; 26-39 ____; 40-45 ____; over 45 ____
4. Educational Background: (Check highest level completed) 1 or 2 years college ____; college graduate BA or BS ____; post-secondary professional or technical school ____; please specify MA, MS, MBA, etc. ____; graduate work beyond masters degree ____; doctorate degree ____
5. Employment Background:
Approximate number of years in company ____
Approximate number of years in professional recruitment ____
Are you anticipating a change of job in the near future? Yes ____ No ____
Possibly ____

EVALUATION

Please check either Yes or No to each of the following questions.

1. Does your company employ any Bachelor of Science in Engineering Technology, BSET, graduates? Yes ____ No ____
2. Were you involved in the recruitment of this employee? Yes ____ No ____
3. Are you an engineer or engineering technologist yourself? Yes ____ No ____
4. At engineering schools do you feel it is an asset for the recruiter to be an engineer or engineering technologist in the initial recruitment interview on campus? Yes ____ No ____

5. Are you aware of the difference between the technologist and the engineer?
Yes ___ No ___
6. Do you consider the engineering technologist as having attained the same professional level as an engineer in a similar discipline? Yes ___ No ___
7. In your opinion, do you feel the engineering technologist is meeting the needs of industry? Yes ___ No ___
8. In your opinion, do engineering firms in general consider the BS - in Engineering Technology degree something less than professional?
Yes ___ No ___

Please circle A, B, or C

9. All areas considered, would you offer an engineering technologist A- lower starting salary, B - higher starting salary, C - same starting salary as an Engineer?
-
10. What title(s) does your company give the engineering technology graduate?
-
11. What other colleges or universities do you recruit at for graduates of the Bachelor of Science in Engineering Technology programs? _____
-
12. Additional Comments: _____
-
-
-
-
-

APPENDIX B

BACHELOR OF SCIENCE IN ENGINEERING TECHNOLOGY
STUDENTS QUESTIONNAIRE

April 6, 1977

NEW JERSEY INSTITUTE OF TECHNOLOGY
NEWARK, NEW JERSEY 07102

BACHELOR OF SCIENCE IN ENGINEERING TECHNOLOGY/STUDENTS QUESTIONNAIRE

PERSONAL DATA

1. Name: _____
2. Present Age: _____
3. Check your option: construction & contracting ____; electrical systems ____; environmental technology ____; manufacturing technology ____; mechanical systems ____.
4. Educational Background:
 - a. Did you transfer to NJIT from a two-year college? Yes ____ No ____
 - b. Did you receive an associate degree in an engineering or technological major? Yes ____ No ____
 - c. Are you a graduate of NJIT's Division of Technology Certificate Program? Yes ____ No ____
 - d. Are you a graduate of any other four year college? Yes ____ No ____
5. Employment Background:
 - a. Are you presently employed? Yes ____ No ____
Circle one: Full-time Part-time
 - b. What is your present job title? _____
 - c. How long have you been working in the above job? _____
 - d. Are you anticipating a change of job in the near future? Yes ____ No ____
Possibly ____

EVALUATION

1. When interviewing with engineering-oriented companies, do you feel it is necessary to sell the BSET program, besides yourself, to the recruiter/interviewer? Yes ____ No ____
2. Do you feel it makes any difference in the initial job interview as to whether or not the recruiter is an engineer or engineering technologist himself/herself? Yes ____ No ____

3. Have you felt the recruiters/interviewers did not quite understand the differences between your BSET curriculum and the BS-engineer's curriculum? Yes ☐ No ☐.
4. Do you feel NJIT's engineering students are biased against the BSET program? Yes ☐ No ☐
5. Did you have an interview with any prospective employers in the NJIT Placement Office? Yes ☐ No ☐
6. Did you make any arrangements of your own to interview at a prospective employer's office? Yes ☐ No ☐
7. Have you had any job offerings? Yes ☐ No ☐
8. Are you considering full-time graduate school in September, 1977?
Yes ☐ No ☐
9. Has the engineering technology program at NJIT met all of your expectations? Yes ☐ No ☐
10. Additional Comments: _____

APPENDIX C

NJIT PLACEMENT OFFICE'S COVER LETTER TO RECRUITERS



**NEW JERSEY
INSTITUTE OF TECHNOLOGY**

323 High Street / Newark, N.J. 07102

Placement Office

(201) 645-5200

April 6, 1977

Dear Colleague:

Thank you for your on-campus interviews during this academic year at New Jersey Institute of Technology (NJIT).

At present, I am engaged in a study of the recruitment process of the Institute's Bachelor of Science in Engineering Technology Program (BSET). Your cooperation in completing the enclosed questionnaire should not take more than five minutes of your time. Any statements you wish to make will be kept anonymous, as this study is only being used to enhance the recruitment program at NJIT.

PLEASE RETURN THE QUESTIONNAIRE NO LATER THAN APRIL 29, 1977 to:

Mr. Joseph Mennella
Assistant Director of Placement
New Jersey Institute of Technology
323 High Street
Newark, New Jersey 07102

A SELF-ADDRESSED ENVELOPE IS ENCLOSED FOR YOUR CONVENIENCE.

Your assistance in this endeavor is deeply appreciated; should you have any questions, please write or telephone me at the above number.

Very sincerely,

Joseph Mennella
Assistant Director of Placement

JM/jr
Enclosure

APPENDIX D

NJIT PLACEMENT OFFICE'S COVER LETTER TO STUDENTS



NEW JERSEY INSTITUTE OF TECHNOLOGY

323 High Street / Newark, N.J. 07102

Placement Office

(201) 645-5200

April 6, 1977

Dear Prospective BSET Graduate:

As you near the completion of your Bachelor of Science in Engineering Technology program at New Jersey Institute of Technology, you are probably contemplating your next objective in life. The NJIT Placement Office is there to assist you in that decision.

However, before some future decisions can be made, particularly with BSET students like yourself, I need your assistance in compiling some data. The enclosed questionnaire pertains to primarily your input of the BSET program and the job recruitment process. Your cooperation in completing the enclosed questionnaire should not take more than five minutes of your time. Any statements you wish to make will be kept anonymous as this study is only being used to enhance the recruitment program in the Placement Office.

PLEASE RETURN THE QUESTIONNAIRE NO LATER THAN MONDAY, APRIL 25, 1977 IN THE ENCLOSED SELF-ADDRESSED ENVELOPE. You may prefer hand carrying it to me instead: ROOM 212, CULLIMORE HALL. The Placement Office is also open Monday evening from 5 to 7 p.m.

Your assistance in this endeavor is deeply appreciated; should you have any questions, please telephone me at the above number.

Very sincerely,

Joseph Mennella
Assistant Director of Placement

JM/jr
Enclosure

APPENDIX E

NJIT 1976 FALL RECRUITING COMPANIES

NEW JERSEY INSTITUTE OF TECHNOLOGY

1976 Fall RecruitingINDUSTRIAL RECRUITING

- * A.I.L. - DIVISION OF CUTLER HAMMER
 - Air Products Company
 - Allied Chemical
- * AUTOMATION INDUSTRIES INC. - VITRO LABS DIVISION
- * B.A.S.F. WYANDOTTE
 - Black & Decker Manufacturing Company
 - Brooklyn Union Gas Company
- C.E. Lummus
- * C.F. BRAUN & COMPANY
 - CPO International Inc. - Best Foods Engineering Services Division
 - Celanese Corporation
 - Cities Service Company
- * CLEVELAND ELECTRIC & ILLUMINATING COMPANY
- * COLGATE - PALMOLIVE
 - Combustion Engineering Incorporated
- * CONSOLIDATED RAIL CORPORATION
 - Control Data Corporation
- * CUTLER HAMMER
- * DIAMOND SHAMROCK CORPORATION
- * EBASCO SERVICES INCORPORATED
 - Engelhard Minerals and Chemicals Corporation
- * EXXON
- * FACTORY MUTUAL ENGINEERING CORPORATION
 - Formation Incorporated
- GAF Corporation - Research and Development
- General Dynamics - Electric Boat Division
- General Foods Technical Center
- Gulf Oil Corporation
- General Motors - Saginaw Steering
- Helena Rubinstein
- Hercules, Incorporated
- Johns - Manville
- Kemper Industries

* Company also on campus in the Spring

1976 Fall Recruiting (continued)

INDUSTRIAL RECRUITING

Lever Brothers Company
Long Island Lighting Company

Monsanto Company
Moore Products Company

New Jersey Bell

* OWENS-CORNING FIBERGLAS CORPORATION

* PPG INDUSTRIES

PRD Electronics
Pfizer, Incorporated

* PROCTER & GAMBLE COMPANY
Philip Morris (January graduates only)

Shell Oil Company
Singer Company - Corporate R & D Laboratory
Sperry Flight Systems

* SQUARE D COMPANY
Standard Oil of Ohio
Stauffer Chemical Company

Teradyne, Incorporated

* TEXACO, INCORPORATED
* TEXAS INSTRUMENTS, INCORPORATED

3M Company
Transcontinental Gas Pipeline Corporation

Uniroyal Chemical
Universal Oil Products Company

* WESTINGHOUSE ELECTRIC CORPORATION
Worthington Pump, Incorporated

CITY AGENCIESU.S. GOVERNMENT AGENCIES

Action - Peace Corps/Vista

* CAPITAL AREA PERSONNEL SERVICES - Department of the Navy
Central Intelligence Agency

* Company/Agency also on campus in the Spring

1976 Fall Recruiting (continued)

U.S. GOVERNMENT AGENCIES

Directorate of Facilities Engineers

* FEDERAL POWER COMMISSION

* NASA - JOHN F. KENNEDY SPACE CENTER
Naval Air Development Center

UNIVERSITIES

Northeastern University - Graduate School of Engineering

Pace University - Graduate School

Rutgers - Graduate School of Business Administration
Rutgers - Graduate School of Business Administration -
Prof. Acct.

* Agency also on campus in the Spring

APPENDIX F

NJIT 1977 SPRING RECRUITING COMPANIES

NEW JERSEY INSTITUTE OF TECHNOLOGY

1977 Spring RecruitingINDUSTRIAL RECRUITING

- Amerada Hess
- Appollo Chemical
- * AIL - DIVISION OF CUTLER HAMMER
- Airco, Incorporated
- American Can Company
- American Cyanamid Company
- American Electric Power Service Corporation
- American International Group
- Anheuser-Busch, Incorporated
- Arthur G. McKee and Company
- Atlantic-Richfield Company
- * AUTOMATION INDUSTRIES, INCORPORATED (Vitro Laboratories)
- Aetna Casualty and Life

- * B.A.S.F. WYANDOTTE
- B.F. Goodrich Company
- Babcock and Wilcox Company
- Baltimore Gas and Electric Company
- Bethlehem Steel Corporation
- Burroughs Corporation
- Burns and Roe, Incorporated

- * C.V. BRAUN AND COMPANY
- CNA Insurance Company
- Caltex Petroleum Corporation
- Carrier Corporation
- Ciba-Geigy Corporation
- * CLEVELAND ELECTRIC AND ILLUMINATING COMPANY
- * COLGATE PALMOLIVE COMPANY
- Colgate Palmolive Company, R & D
- Consolidated Edison Company of New York
- * CONSOLIDATED RAIL CORPORATION
- Continental Group, Incorporated (formerly Continental Can Company)
- Continental Oil Company
- * CONTROL DATA CORPORATION
- Crawford and Russell, Incorporated
- * CUTLER HAMMER
- Cheesebrough Ponds
- Chevron Oil

- Davy Powergas, Incorporated
- * DIAMOND SHAMROCK CORPORATION
- Digital Equipment Corporation

- * Company also on campus in the Fall

1977 Spring Recruiting (continued)

INDUSTRIAL RECRUITING

Dow Chemical U.S.A.
Duke Power Company

- E.I. DuPont DeNemours and Company
Eastman Kodak Company
* EBASCO SERVICES, INCORPORATED
Estee Lauder, Incorporated
* EXXON RESEARCH AND ENGINEERING COMPANY
Engelhard Minerals and Chemicals Corporation

- Federal Pacific Electric
FMC Corporation
* FACTORY MUTUAL ENGINEERING CORPORATION
The Firestone Tire and Rubber Company
Fluor Engineers and Constructors, Incorporated
Ford Motor Company
Foster Wheeler

General Dynamics - Electro Dynamics Division
GPU Service Corporation
GTE Sylvania, Incorporated
General Electric Company
Gulf Oil

Hamilton Standard - Division of United Technologies
Hazelbine Corporation
Hercules, Incorporated
Hewlett Packard
Hughes Aircraft Company
Harrison Radiator

ICI United States, Incorporated
ITT - Avionics Division
ITT - Defense Communications Division
Industrial Risk Insurers
Ingersoll-Rand Company
International Paper Company
International Playtex

Jersey Central Power and Light Company
Johnson Controls, Incorporated

- * KEMPER INSURANCE COMPANY
Koppers Company, Incorporated
Kurt Salmon Associates, Incorporated

* Company also on campus in the Fall

1977 Spring Recruiting (continued)

INDUSTRIAL RECRUITING

Leeds and Northrup Corporation
Loral Electronics Systems

Metaframe Corporation
McGraw-Edison Company
Merck and Company, Incorporated
Midlantic National Bank
Mobil Oil Corporation
Motorola, Incorporated - Semiconductor Products Division

National CSS
NL Industries, Incorporated
National Starch and Chemical Corporation
Newport News Shipbuilding

Ohaus Scale Corporation
* OWENS-CORNING FIBERGLAS CORPORATION

* PPG INDUSTRIES
* PHILIP MORRIS, U.S.A.
Poloroid Corporation
Pratt and Whitney Aircraft
* PROCTER AND GAMBLE COMPANY
Procter and Gamble Paper Products Company
Public Service Electric and Gas Company
Pullman-Kellogg
Perdue, Incorporated

RCA
* RAYTHEON COMPANY
Rockwell International Corporation
Royal Globe Insurance Company
Republic Steel

SCM Corporation
Scott Paper Company
Singer Company - Kearfott Division
Singer Company - Simulation Products Division
Sperry Univac Computer Systems
* SQUARE D COMPANY
Stone and Webster Engineering Corporation

* TEXAS INSTRUMENTS, INCORPORATED
The Trane Company

Underwriter Laboratories, Incorporated

* Company also on campus in the Fall

1977 Spring Recruiting (continued)

INDUSTRIAL RECRUITING

Union Carbide Corporation
United States Gypsum Company
United States Steel Corporation

Wallace and Tiernan
Warner and Swasey Company
* WESTINGHOUSE ELECTRIC CORPORATION

Xerox Corporation

York Air Conditioning

STATE AGENCIES

New Jersey Department of Transportation, City of New York -
Controllers Office

U.S. FEDERAL AGENCIES

* ACTION - PEACE CORPS/VISTA

* CAPITAL AREA PERSONNEL SERVICES - DEPARTMENT OF THE NAVY
Corps of Engineers - Department of the Army

* FEDERAL POWER COMMISSION

Griffiss Air Force Base, New York

Housing Urban Development

* NASA - JOHN F. KENNEDY SPACE CENTER
National Security Agency

* Company/Agency also on campus in the Fall

APPENDIX G

RECRUITMENT QUESTIONNAIRE - EVALUATION
QUESTIONS 1 - 9

Table Sixteen

Recruitment Questionnaire - Evaluation Questions 1-9

N=154

Question:

1. Does your company employ any Bachelor of Science in Engineering Technology, BSET, graduates?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
83	57.2	62	42.8	9	5.8	145	94.2

2. Were you involved in the recruitment of this employee?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
60	49.6	61	50.4	33	21.5	121	78.5

3. Are you an engineer or engineering technologist yourself?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
67	44.1	85	55.9	2	1.3	152	98.7

4. At engineering schools do you feel it is an asset for the recruiter to be an engineer or engineering technologist in the initial recruitment interview on campus?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
84	56.0	66	44.0	4	2.6	150	97.4

5. Are you aware of the difference between the technologist and the engineer?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
128	88.3	17	11.7	9	5.8	145	94.2

Table Sixteen (continued)

Question:

6. Do you consider the engineering technologist as having attained the same professional level as an engineer in a similar discipline?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
45	33.3	90	66.7	19	12.4	135	87.6

7. In your opinion, do you feel the engineering technologist is meeting the needs of industry?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
98	81.7	22	18.3	34	22.1	120	77.9

8. In your opinion, do engineering firms in general consider the BS-in Engineering Technology degree something less than professional?

YES		NO		BLANK		TOTAL YES & NO	
#	%	#	%	#	%	#	%
83	67.5	40	32.5	31	20.1	123	79.9

9. Please Circle A, B or C:

All areas considered, would you offer an engineering technologist: A - lower starting salary, B - higher starting salary, C - same starting salary as an Engineer?

A		B		C		BLANK		ANSWERED	
#	%	#	%	#	%	#	%	#	%
80	60.6	0	0	52	39.4	22	14.3	132	85.7